Mast range:
Section HEB 160 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>HA (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2.0</td>
<td>620</td>
<td>32</td>
</tr>
<tr>
<td>25</td>
<td>2.5</td>
<td>730</td>
<td>40</td>
</tr>
<tr>
<td>30</td>
<td>3.0</td>
<td>840</td>
<td>47</td>
</tr>
<tr>
<td>35</td>
<td>3.5</td>
<td>950</td>
<td>54</td>
</tr>
<tr>
<td>40</td>
<td>4.0</td>
<td>1060</td>
<td>62</td>
</tr>
<tr>
<td>45</td>
<td>4.5</td>
<td>1170</td>
<td>69</td>
</tr>
</tbody>
</table>

Force:
- $F_{adm\ 1} \ (kN) = 2.5$
- $F_{adm\ 2} \ (kN) = 1.6$

Note:
Upper member marked with hole.

Fasteners:
Supplied complete with U-bolts 2191

Other fasteners:
- Hook bolt to HEB 3253
- U-bolt for wooden pole 2192

Associated parts:
- Clamp for suspension 5311
- Cross arm for feeder 2351 o/w
- Earth rope clamp for cantilever 6216

Drawing number:
351.00045

Ordering information:
Length 2.5 m, on HEB 180
2111.25.18 Cantilever spread for 1 track (type I)
Furrer | Frey

2112  Cantilever for inclined catenary, long (type II)

<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>HA (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>3,5</td>
<td>750</td>
<td>62</td>
</tr>
<tr>
<td>40</td>
<td>4,0</td>
<td>810</td>
<td>71</td>
</tr>
<tr>
<td>45</td>
<td>4,5</td>
<td>880</td>
<td>79</td>
</tr>
<tr>
<td>50</td>
<td>5,0</td>
<td>930</td>
<td>88</td>
</tr>
<tr>
<td>55</td>
<td>5,5</td>
<td>990</td>
<td>96</td>
</tr>
<tr>
<td>60</td>
<td>6,0</td>
<td>1040</td>
<td>105</td>
</tr>
</tbody>
</table>

Force:

\[ F_{adm} = 2.5 \] (kN)

Fasteners:

Supplied complete with U-bolts and long shank bolts.

Fasteners to wooden pole:
- Bracket for termination 3217
- Compression clamp 2194

Associated parts:
- Clamp for suspension within the 880 dimension 5311
- Clamp for suspension 5312
- Suspension bracket for 1.5 kV or 15 kV 5314
- Earth rope clamp for cantilever 6216

Drawing number:

353.00002, .00038

Ordering information:

Length 4.5 m, on HEB 220

2112.45.22 Cantilever for inclined catenary, long (type II)
Cantilever for 2 tracks (type III / UNP 65)

Mast range:
Section HEB 200 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>L1 (m)</th>
<th>L2 (m)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>5,0</td>
<td>3,75</td>
<td>1,25</td>
<td>98</td>
</tr>
<tr>
<td>55</td>
<td>5,5</td>
<td>3,75</td>
<td>1,75</td>
<td>106</td>
</tr>
<tr>
<td>60</td>
<td>6,0</td>
<td>3,75</td>
<td>2,25</td>
<td>114</td>
</tr>
<tr>
<td>65</td>
<td>6,5</td>
<td>3,75</td>
<td>2,75</td>
<td>121</td>
</tr>
<tr>
<td>70</td>
<td>7,0</td>
<td>3,75</td>
<td>3,25</td>
<td>129</td>
</tr>
</tbody>
</table>

Force:
- $F_{adm\,1}\, (\text{kN}) = 2,5$
- $F_{adm\,2}\, (\text{kN}) = 1,6$
- $F_{adm\,3}\, (\text{kN}) = 0,6$

Fasteners:
Supplied complete with U-bolts.

Associated parts:
- Clamp for suspension 5313
- Pull-off arm for cantilever 2141
- Drop bracket 2143
- Cross arm for feeder 2351 o/w
- Earth rope clamp for cantilever 6216

Drawing number:
353.00164, .00848 - .00850

Ordering information:
Length 7,0 m, on HEB 240
2113.70.24 Cantilever for 2 tracks
(type III / UNP 65)
Cantilever for 2 tracks (type III / UNP 100)

Mast range:
Section HEB 200 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>H (m)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>5,0</td>
<td>1,60</td>
<td>144</td>
</tr>
<tr>
<td>55</td>
<td>5,5</td>
<td>1,60</td>
<td>155</td>
</tr>
<tr>
<td>60</td>
<td>6,0</td>
<td>1,60</td>
<td>167</td>
</tr>
<tr>
<td>65</td>
<td>6,5</td>
<td>1,60</td>
<td>178</td>
</tr>
<tr>
<td>70</td>
<td>7,0</td>
<td>1,60</td>
<td>190</td>
</tr>
<tr>
<td>75</td>
<td>7,5</td>
<td>1,60</td>
<td>201</td>
</tr>
<tr>
<td>80</td>
<td>8,0</td>
<td>1,60</td>
<td>213</td>
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<tr>
<td>85</td>
<td>8,5</td>
<td>2,00</td>
<td>224</td>
</tr>
<tr>
<td>90</td>
<td>9,0</td>
<td>2,00</td>
<td>236</td>
</tr>
<tr>
<td>95</td>
<td>9,5</td>
<td>2,00</td>
<td>247</td>
</tr>
<tr>
<td>100</td>
<td>10,0</td>
<td>2,00</td>
<td>259</td>
</tr>
</tbody>
</table>

Force:
\[ F_{adm}^1 (\text{kN}) = 2,5 \]
\[ F_{adm}^2 (\text{kN}) = 1,6 \]
\[ F_{adm}^3 (\text{kN}) = 0,6 \]

Fasteners:
Supplied complete with U-bolts.

Associated parts:
Clamp for suspension 5313
Drop bracket 2143
Cross arm for feeder 2351 o/w
Earth rope clamp for cantilever 6216

Drawing number:
353.00208, .00857 - .00859

Ordering information:
Length 8,5 m, on HEB 220
2113.1.85.22 Cantilever for 2 tracks
(type III / UNP 100)
Cantilever for 2 tracks (UPE 140) 2113.2

Mast range:
Section HEB 240 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>H (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>060</td>
<td>6,0</td>
<td>1,6</td>
</tr>
<tr>
<td>065</td>
<td>6,5</td>
<td>1,6</td>
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<tr>
<td>070</td>
<td>7,0</td>
<td>1,6</td>
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<tr>
<td>075</td>
<td>7,5</td>
<td>2,0</td>
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<tr>
<td>080</td>
<td>8,0</td>
<td>2,0</td>
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<tr>
<td>085</td>
<td>8,5</td>
<td>2,0</td>
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<tr>
<td>090</td>
<td>9,0</td>
<td>2,0</td>
</tr>
<tr>
<td>095</td>
<td>9,5</td>
<td>2,5</td>
</tr>
<tr>
<td>100</td>
<td>10,0</td>
<td>2,5</td>
</tr>
<tr>
<td>105</td>
<td>10,5</td>
<td>2,5</td>
</tr>
<tr>
<td>110</td>
<td>11,0</td>
<td>2,5</td>
</tr>
<tr>
<td>115</td>
<td>11,5</td>
<td>3,0</td>
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<tr>
<td>120</td>
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<td>3,0</td>
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<tr>
<td>125</td>
<td>12,5</td>
<td>3,0</td>
</tr>
<tr>
<td>130</td>
<td>13,0</td>
<td>3,0</td>
</tr>
</tbody>
</table>

Fasteners:
Supplied complete with U-bolts

Drawing number:
353.00541

Ordering information:
Length 11.5 m, on HEB 260
2113.2.115.26 Cantilever for 2 tracks (UPE 140)
Cantilever for 1 track with pull-off arm (type IV)

Mast range:
Section HEB 180 - 220 240

<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>H (m)</th>
<th>HA (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>46.15</td>
<td>4.6</td>
<td>1.5</td>
<td>1320</td>
<td>92</td>
</tr>
<tr>
<td>46.20</td>
<td>4.6</td>
<td>2.0</td>
<td>1320</td>
<td>101</td>
</tr>
<tr>
<td>46.25</td>
<td>4.6</td>
<td>2.5</td>
<td>1320</td>
<td>108</td>
</tr>
<tr>
<td>51.15</td>
<td>5.1</td>
<td>1.5</td>
<td>1370</td>
<td>101</td>
</tr>
<tr>
<td>51.20</td>
<td>5.1</td>
<td>2.0</td>
<td>1370</td>
<td>110</td>
</tr>
<tr>
<td>51.25</td>
<td>5.1</td>
<td>2.5</td>
<td>1370</td>
<td>117</td>
</tr>
<tr>
<td>55.15</td>
<td>5.5</td>
<td>1.5</td>
<td>1390</td>
<td>107</td>
</tr>
<tr>
<td>55.20</td>
<td>5.5</td>
<td>2.0</td>
<td>1390</td>
<td>115</td>
</tr>
<tr>
<td>55.25</td>
<td>5.5</td>
<td>2.5</td>
<td>1390</td>
<td>122</td>
</tr>
<tr>
<td>62.15</td>
<td>6.2</td>
<td>1.5</td>
<td>1500</td>
<td>119</td>
</tr>
<tr>
<td>62.20</td>
<td>6.2</td>
<td>2.0</td>
<td>1500</td>
<td>127</td>
</tr>
<tr>
<td>62.25</td>
<td>6.2</td>
<td>2.5</td>
<td>1500</td>
<td>134</td>
</tr>
</tbody>
</table>

Force:
- $F_{adm}^1$ (kN) = 2.5
- $F_{adm}^2$ (kN) = 1.6
- $F_{adm}^3$ (kN) = 0.6

Fasteners:
Supplied complete with U-bolts and long shank bolts.

Associated parts for wooden pole:
- Bracket for termination 3217
- Compression clamp 2194

Associated parts:
- Clamp for suspension 5311
- Bracket for steady army Type 65 5413
- Cross arm for feeder 2351 o/w
- Earth rope clamp for pull-off arm 6217

Drawing number:
351.00041 - .00043

Ordering information:
Length 5.5 m, pull-off arm 2.0 m, on HEB 240
2114.55.20.24 Cantilever for 1 track with pull-off arm (type IV)
Mast range:
Section HEB 160 - 200
220 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>07</td>
<td>0,7</td>
<td>17</td>
</tr>
<tr>
<td>11</td>
<td>1,1</td>
<td>21</td>
</tr>
</tbody>
</table>

Force:
\[ F_{\text{adm}}^1 (\text{kN}) = 1,0 \]
\[ F_{\text{adm}}^2 (\text{kN}) = 4,5 \]

Fasteners:
Supplied complete with U-bolts.

Drawing number:
352.00002

Ordering information:
Length 0,7 m, on HEB 180
2117.07.18 Cantilever for inclined catenary, short
Pull-off arm for cantilever (type III / UNP 65) 2141

<table>
<thead>
<tr>
<th>Type</th>
<th>H (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2000</td>
<td>46</td>
</tr>
<tr>
<td>25</td>
<td>2500</td>
<td>53</td>
</tr>
</tbody>
</table>

**Force:**
\[ F_{adm} = 0.6 \] (kN)

**Fasteners:**
Supplied complete with bolts.

**Associated parts:**
Bracket for steady arm
Type 60, 65 5413
Earth rope clamp for cantilever 6216

**Drawing number:**
353.00343

**Ordering information:**
Heigth 2000 mm
2141.20 Pull-off arm for cantilever (type III / UNP 65)

Drop tube for cantilever (type III) 2143

<table>
<thead>
<tr>
<th>Type</th>
<th>Cantilever</th>
<th>L (m)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.16</td>
<td>III / UNP 65</td>
<td>1.6</td>
<td>29.7</td>
</tr>
<tr>
<td>1.18</td>
<td>III / UNP 65</td>
<td>1.8</td>
<td>32.0</td>
</tr>
<tr>
<td>1.20</td>
<td>III / UNP 65</td>
<td>2.0</td>
<td>34.4</td>
</tr>
<tr>
<td>1.22</td>
<td>III / UNP 65</td>
<td>2.2</td>
<td>36.8</td>
</tr>
<tr>
<td>1.24</td>
<td>III / UNP 65</td>
<td>2.4</td>
<td>39.2</td>
</tr>
<tr>
<td>1.26</td>
<td>III / UNP 65</td>
<td>2.6</td>
<td>41.6</td>
</tr>
<tr>
<td>1.28</td>
<td>III / UNP 65</td>
<td>2.8</td>
<td>43.9</td>
</tr>
<tr>
<td>1.30</td>
<td>III / UNP 65</td>
<td>3.0</td>
<td>46.3</td>
</tr>
<tr>
<td>2.16</td>
<td>III / UNP 100</td>
<td>1.6</td>
<td>29.8</td>
</tr>
<tr>
<td>2.18</td>
<td>III / UNP 100</td>
<td>1.8</td>
<td>33.3</td>
</tr>
<tr>
<td>2.20</td>
<td>III / UNP 100</td>
<td>2.0</td>
<td>34.5</td>
</tr>
<tr>
<td>2.22</td>
<td>III / UNP 100</td>
<td>2.2</td>
<td>36.9</td>
</tr>
<tr>
<td>2.24</td>
<td>III / UNP 100</td>
<td>2.4</td>
<td>39.3</td>
</tr>
<tr>
<td>2.26</td>
<td>III / UNP 100</td>
<td>2.6</td>
<td>41.7</td>
</tr>
<tr>
<td>2.28</td>
<td>III / UNP 100</td>
<td>2.8</td>
<td>44.0</td>
</tr>
<tr>
<td>2.30</td>
<td>III / UNP 100</td>
<td>3.0</td>
<td>46.4</td>
</tr>
</tbody>
</table>

**Force:**
\[ F_{adm} = 0.6 \] (kN)

**Fasteners:**
Supplied complete with U-bolts.

**Associated parts:**
Bracket for steady arm 5411 o/w

**Drawing number:**
357.00053

**Ordering information:**
Cantilever III / UNP 65, length 2.8 m
2143.1.28 Drop tube for cantilever (type III)
Insulation without stand-off

System height 2.20, Mast distance 3.50

System height 1.60
Mast distance 2.80

System height 1.20
Mast distance 2.80

System height 1.00
Mast distance 2.50

System height 2.20, Mast distance 3.50
Insulation with stand-off
System height 2.20, Mast distance 3.50

System height 1.60, Mast distance 2.80
System height 1.20, Mast distance 2.80
System height 1.00, Mast distance 2.50
Mast range:
Section HEB 200 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>Z (mm)</th>
<th>L (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.04</td>
<td>14</td>
<td>0.380</td>
</tr>
<tr>
<td>1.06</td>
<td>14</td>
<td>0.580</td>
</tr>
<tr>
<td>1.08</td>
<td>14</td>
<td>0.780</td>
</tr>
<tr>
<td>1.10</td>
<td>14</td>
<td>0.980</td>
</tr>
<tr>
<td>1.12</td>
<td>14</td>
<td>1.180</td>
</tr>
<tr>
<td>2.04</td>
<td>23</td>
<td>0.380</td>
</tr>
<tr>
<td>2.06</td>
<td>23</td>
<td>0.580</td>
</tr>
<tr>
<td>2.08</td>
<td>23</td>
<td>0.780</td>
</tr>
<tr>
<td>2.10</td>
<td>23</td>
<td>0.980</td>
</tr>
<tr>
<td>2.12</td>
<td>23</td>
<td>1.180</td>
</tr>
</tbody>
</table>

Note:
When ordering state height H.
Height min. 1.0 m
Height max. 2.2 m

Fasteners:
Supplied complete with U-bolts.

Associated parts:
Solid core insulator 5133 o/w

Drawing number:
353.00138

Ordering information:
Z = 14, length 0.980 m, height 2.0 m,
on HEB 220
2151.1.10.20.22 Stand-off bracket
moveable for tubular cantilever FL 200
/ 260

---

Mast bracket for tubular cantilever FL 200 / 260

Material:
Al-cast

Mast range:
Section HEB 100 - 160
180 - 260

Fasteners:
Supplied complete with U-bolts.

Associated parts:
Rod insulator 5133 o/w

Drawing number:
353.00180, .00895

Ordering information:
on HEB 200
2152.20 Mast bracket for tubular
cantilever FL 200 / 260
Material:
Al-cast

Mast range:
Section HEB 100 - 160
180 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>Z (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
</tr>
</tbody>
</table>

Fasteners:
Supplied complete with U-bolt.

Associated parts:
Rod insulator 5133 o/w

Drawing number:
353.00181, .00772 - .00774

Ordering information:
Z = 14 mm, on HEB 240
2153.1.24 Mast bracket for tubular cantilever FL 200 / 260
Pair of cross arms for 2 tubular cantilevers FL 200 / 260

Mast range:
Section HEB 160
180 - 260

Type Z
  (mm)
  1  14
  2  22

Note:
L = left as seen from the track
R = right as seen from the track

Fasteners:
Supplied complete with U-bolts

Associated parts:
Rod insulator 5133 o/w

Drawing number:
451.00211

Ordering information:
Z = 22 mm, Right, on HEB 240
2153.3.R.24 Pair of cross arms for 2 tubular cantilevers FL 200 / 260
**2154 Top tube for tubular cantilever FL 200 / 260**

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>D (mm)</th>
<th>Wt (kg)</th>
<th>Insulator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Fe stainless</td>
<td>70</td>
<td>4,9</td>
<td>5133-34, 5136, 5138-39</td>
</tr>
<tr>
<td>1.2</td>
<td>Fe stainless</td>
<td>70</td>
<td>4,9</td>
<td>5135</td>
</tr>
<tr>
<td>2.1</td>
<td>Fe hot dip galv</td>
<td>70</td>
<td>4,9</td>
<td>5133-34, 5136, 5138-39</td>
</tr>
<tr>
<td>2.2</td>
<td>Fe hot dip galv</td>
<td>70</td>
<td>4,9</td>
<td>5135</td>
</tr>
<tr>
<td>3.1</td>
<td>Al</td>
<td>80</td>
<td>4,4</td>
<td>5133-34, 5136, 5138-39</td>
</tr>
<tr>
<td>3.2</td>
<td>Al</td>
<td>80</td>
<td>4,4</td>
<td>5135</td>
</tr>
</tbody>
</table>

**Note:**
- Length L min. 2,0 m
- Length L max. 3,5 m
- Available in steps of 0,3 m
- Other tube lengths available on request.
- x.2 = Supplied without screw M 16 for insulator

**Associated parts:**
- Bracket with clevis 2159
- Rotatable support 5322 o/w

**Drawing number:**
- 353.00103, 353.00746 - .00750

**Ordering information:**
- Cantilever top tube Fe stainless, for insulator 5133, length 2,9 m
- 2154.1.1.29 Top tube for tubular cantilever FL 200 / 260

---

**2155 Strut tube for tubular cantilever FL 200 / 260**

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>D (mm)</th>
<th>Wt (kg)</th>
<th>Insulator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fe stainless</td>
<td>70</td>
<td>4,9</td>
<td>5133-34, 5136, 5138-39</td>
</tr>
<tr>
<td>1.2</td>
<td>Fe stainless</td>
<td>70</td>
<td>4,9</td>
<td>5135</td>
</tr>
<tr>
<td>2</td>
<td>Fe hot dip galv</td>
<td>70</td>
<td>4,9</td>
<td>5133-34, 5136, 5138-39</td>
</tr>
<tr>
<td>2.2</td>
<td>Fe hot dip galv</td>
<td>70</td>
<td>4,9</td>
<td>5135</td>
</tr>
<tr>
<td>3.1</td>
<td>Al</td>
<td>80</td>
<td>4,4</td>
<td>5133-34, 5136, 5138-39</td>
</tr>
<tr>
<td>3.2</td>
<td>Al</td>
<td>80</td>
<td>4,4</td>
<td>5135</td>
</tr>
</tbody>
</table>

**Note:**
- Length L min. 2,0 m
- Length L max. 3,2 m
- Available in steps of 0,1 m
- Other tube lengths available on request.
- x.2 = Supplied without screw M 16 for insulator

**Associated parts:**
- Clevis clamp 2159

**Drawing number:**
- 353.00104, .00754 - .00758

**Ordering information:**
- Strut tube Fe stainless, for insulator 5135, length 2,6 m
- 2155.1.2.26 Strut tube for tubular cantilever FL 200 / 260
### Cantilever brace tube for tubular cantilever FL 200 / 260

<table>
<thead>
<tr>
<th>Type</th>
<th>Material pulley</th>
<th>D (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fe stainless</td>
<td>38</td>
<td>2,6</td>
</tr>
<tr>
<td>2</td>
<td>Fe hot dip galv</td>
<td>38</td>
<td>2,3</td>
</tr>
<tr>
<td>3</td>
<td>Al</td>
<td>50</td>
<td>1,6</td>
</tr>
</tbody>
</table>

**Note:**
- Length $L_{min}$: 0,3 m
- Length $L_{max}$: 2,4 m
- Available in steps of 0,1 m
- Other tube lengths available on request.

**Drawing number:** 353.00105, .00775, .00776

**Ordering information:**
- Brace tube Fe stainless, length 1,2 m
- Cantilever brace tube for tubular cantilever FL 200 / 260

### Steady arm tube for tubular cantilever FL 200 / 260

<table>
<thead>
<tr>
<th>Type</th>
<th>Material pulley</th>
<th>D (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fe stainless</td>
<td>38</td>
<td>2,6</td>
</tr>
<tr>
<td>2</td>
<td>Fe hot dip galv</td>
<td>38</td>
<td>2,3</td>
</tr>
<tr>
<td>3</td>
<td>Al</td>
<td>50</td>
<td>1,6</td>
</tr>
</tbody>
</table>

**Note:**
- Length $L_{min}$: 0,8 m
- Length $L_{max}$: 4,2 m
- Available in steps of 0,2 m
- Other tube lengths available on request.

**Associated parts:**
- Clevis clamp 2159
- Drop bracket 5451

**Drawing number:** 353.00106, .00777, .00778

**Ordering information:**
- Steady arm tube Fe stainless, length 3,4 m
- Steady arm tube for tubular cantilever FL 200 / 260
2158 Pull-off rope for tubular cantilever FL 200 / 260

Material:
- Rope: Fe stainless
- Crimp connector: Cu

Note:
- Length L min. 0,3 m
- Length L max. 2,4 m
- Available in steps of 0,1 m
- Other rope lengths available on request.

Drawing number:
353.00161

Ordering information:
- Length 0,50 m
- 2158.05 pull of rope for tubular cantilever FL 200 / 260

2159 Clevis clamp for tube ø 30 - 80 mm for tubular cantilever FL 200 / 260

Material:
- G-AlSiMg

Note:
- State tube diameter when ordering.
- Standard diameters: 38, 48, 55, 70, and 76 mm.
- Other diameters on request.

Drawing number:
353.00107, 00108

Ordering information:
- for tube ø 38 mm
- 2159.38 Clevis clamp for tube ø 30 - 80 mm for tubular cantilever FL 200 / 260

2159.1 Clamp with flag for tube ø 30 - 80 mm for tubular cantilever FL 200 / 260

Material:
- G-AlSiMg

Note:
- State tube diameter when ordering.
- Standard diameters: 38, 48, 55, 70 and 76 mm.
- Other diameters on request.

Drawing number:
353.00347, 00348

Ordering information:
- for tube ø 38 mm
- 2159.1.38 Clevis clamp for tube ø 30 - 80 mm for tubular cantilever FL 200 / 260
Cantilever on tangent track and inside of curve

Cantilever on tangent track and outside of curve
Cantilever on tangent track with stitch-wire suspension

Cantilever on inside of curve with stitch-wire suspension
Mast bracket with hinge for fully insulated tubular cantilever

2161

Material:
Bracket Fe hot dip galv
Fittings CuSn

Mast range:
Section HEB 160
180 - 240
260

Type  Model
1  with hinge
2  with double hinge

Associated parts:
Cantilever tube 2163
Support tube 2164

Drawing number:
522.00133, .00135 - .00137, .00139, .00144

Ordering information:
with hinge, on HEB 200
2161.1.20 Mast bracket with hinge for fully insulated tubular cantilever

Termination bracket for fully insulated tubular cantilever

2162

Mast range:
Section HEB 160
180 - 240
260

Associated parts:
Universal hook 3344

Drawing number:
522.00086, .00142, .00143

Ordering information:
on HEB 180
2162.18 Termination bracket for fully insulated tubular cantilever
**2163** Cantilever top tube, synthetic for fully insulated tubular cantilever

Material:
- Tube: GF-EP
- Fittings: CuAl

Weight:
- Wt (kg/m) = 1.4 (without fittings)

Note:
- State length L when ordering.
- Max. length in stock 7.0 m.

Associated parts:
- Strut tube 2164

Ordering information:
- Length 2.45 m
- 2163.245 Cantilever top tube, synthetic for fully insulated tubular cantilever

---

**2164** Strut tube, synthetic for fully insulated tubular cantilever

Material:
- Tube: GF-EP
- Fittings: CuAl

Weight:
- Wt (kg/m) = 2.4 (without fittings)

Note:
- Clamp range 50-150 mm²
- State length L when ordering.
- Max. length in stock 8.0 m.

Associated parts:
- Steady arm tube 2165
- Kevlar cable 4451

Ordering information:
- Length 3.25 m
- 2164.325 Strut tube, synthetic for fully insulated tubular cantilever
Steady arm tube, synthetic for fully insulated tubular cantilever

**Material:**
- Tube: GF-EP
- Fittings: CuAl

<table>
<thead>
<tr>
<th>Type</th>
<th>D (mm)</th>
<th>Length in stock (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>38</td>
<td>7,0</td>
</tr>
<tr>
<td>55</td>
<td>55</td>
<td>8,0</td>
</tr>
</tbody>
</table>

**Note:**
State length L when ordering.

**Associated parts:**
- Eye clamp 2166
- Double tube clamp 2167
- Drop bracket 5452

**Ordering information:**
Tube ø 38 mm, length 3,90 m
2165.38.390 Steady arm tube, synthetic for fully insulated tubular cantilever

---

Tube clamp drop suspension for fully insulated tubular cantilever

**Material:**
CuAl

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>D (mm)</th>
<th>H (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.38</td>
<td>with eye</td>
<td>38</td>
<td>45</td>
</tr>
<tr>
<td>1.55</td>
<td>with eye</td>
<td>55</td>
<td>60</td>
</tr>
<tr>
<td>2.38</td>
<td>with hook</td>
<td>38</td>
<td>40</td>
</tr>
<tr>
<td>2.55</td>
<td>with hook</td>
<td>55</td>
<td>50</td>
</tr>
<tr>
<td>3.55</td>
<td>groove type</td>
<td>55</td>
<td>87</td>
</tr>
</tbody>
</table>

**Note:**
t = thickness

**Associated parts:**
- Type 1
  - Shackle 3357
  - Steady arm 5583
- Type 2
  - Turnbuckle 2169
  - Shackle 3357
- Type 3
  - Contact wire clip 5552 ff

**Drawing number:**
356.00096 - .00099

**Ordering information:**
with eye, on tube ø 38 mm
2166.1.38 Tube clamp drop suspension for fully insulated tubular cantilever
**2167**  
Double tube clamp for fully insulated tubular cantilever

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>with suspension clip, with eye</td>
</tr>
<tr>
<td>2</td>
<td>with suspension clip, without eye</td>
</tr>
<tr>
<td>3</td>
<td>without suspension clip, with eye</td>
</tr>
<tr>
<td>4</td>
<td>without suspension clip, without eye</td>
</tr>
</tbody>
</table>

**Material:**  
CuAl

**Note:**  
For double tube cantilever over 2 tracks.  
A = Suspension clip  
O = Eye

**Associated parts:**  
Shackle 3357 o/w  
Pulley suspension 2168

**Ordering information:**  
with suspension clip, with eye  
2167.1 Double tube clamp for fully insulated tubular cantilever

---

**2168**  
Pulley suspension for fully insulated tubular cantilever

**Material:**  
Clevis CuAl  
Pulley Polyamid

**Associated parts:**  
Shackle 3357

**Ordering information:**  
2168 Pulley suspension for fully insulated tubular cantilever

---

**2169**  
Turnbuckle M 8 for fully insulated tubular cantilever

**Material:**  
Fe stainless

**Associated parts:**  
Shackle 3357 o/w

**Ordering information:**  
2169 Turnbuckle M 8 for fully insulated tubular cantilever
Cantilever on tangent track and inside of curve
System height 1.60, Mast distance 3.50

Cantilever on tangent track and outside of curve
System height 1.60, Mast distance 3.50

Cantilever with pull-off on cable
System height 1.60, System height 3.50

Cantilever with head- and pull-off cable
System height 1.60, System height 3.50
Material:  
Bracket: Fe stainless  
Eye fitting: Al-cast  

Mast range:  
Section HEB  
100 - 160  
180 - 220  
240 - 260  

Type | Description  | F_{adm} (kN)  
--- | --- | ---  
1 | with eye fitting | 3  
2 | without eye fitting | 15  

Fasteners:  
Supplied complete with U-bolts.  

Associated parts:  
Top tube 2173  
Strut tube 2174  
Pull-off registration 2177  

Drawing number:  
356.00045, .00120 - .00124  

Ordering information:  
with eye fitting, on HEB 200 Mast bracket on HEB for Liracos  

---  

Material:  
Bracket: Fe stainless  
Eye fitting: Al-cast  

Type | Description | F_{adm} (kN)  
--- | --- | ---  
1 | 1 threaded bolt | 3  
3 | 3 threaded bolts | 15  

Pole range  
(d mm) | (d mm)  
--- | ---  
180 | 180 - 260  
260 | 260 - 300  
300 | 300 - 440  

Associated parts:  
Top tube 2173  
Strut tube 2174  
Pull-off registration 2177  

Drawing number:  
356.00046, .00125 - .00129  

Ordering information:  
1 threaded bolt, on tubular mast ø 180 mm Mast bracket on round pole for Liracos
### 2173  Top tube for Liracos

**Material:**
- Tube: GFK
- Fittings: Alu-cast

**Type**  |  **Fittings**  
---|---
1 | Clevis type on one end
2 | Clevis type on both ends

<table>
<thead>
<tr>
<th>Tube D (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>1,5</td>
</tr>
<tr>
<td>55</td>
<td>2,6</td>
</tr>
<tr>
<td>70</td>
<td>3,9</td>
</tr>
</tbody>
</table>

**Note:**
- Length L max. 4,20 m
- Available in steps of 0,10 m. Other tube lengths available on request.

**Associated parts:**
- Tube clamp 2166.3.
- Rotable support 5324

**Drawing number:**
- 356.00034, 00035, 00055, 00068, 00069, 00072

**Ordering information:**
- Type 1, tube ø 38 mm, length 2,20 m
- 2173.1.38.220 Top tube for Liracos

### 2174  Strut tube for Liracos

**Material:**
- Tube: GFK
- Fittings: Alu-cast

<table>
<thead>
<tr>
<th>Type</th>
<th>D (mm)</th>
<th>L1 (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>55</td>
<td>105</td>
<td>2,6</td>
</tr>
<tr>
<td>70</td>
<td>70</td>
<td>110</td>
<td>3,9</td>
</tr>
</tbody>
</table>

**Note:**
- Length L max. 4,20 m
- Available in steps of 0,10 m. Other tube lengths available on request.

**Associated parts:**
- Pull-off registration 2177
- Steady arm tube cable 2178

**Drawing number:**
- 356.00038, 00039

**Ordering information:**
- Tube ø 55 mm, length 3,00 m
- 2174.55.300 Strut tube for Liracos
### Steady arm tube for Liracos

**Material:**
- Tube: GFK
- Fittings: Al-cast

<table>
<thead>
<tr>
<th>Type</th>
<th>D (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>38</td>
<td>1,5</td>
</tr>
<tr>
<td>55</td>
<td>55</td>
<td>2,6</td>
</tr>
</tbody>
</table>

**Note:**
- Length L min. 1,00 m
- Length L max. 5,25 m
- Available in steps of 0,25 m. Other tube lengths available on request.

**Associated parts:**
- Drop bracket: 5453
- Flap clamp: 2159.1

**Drawing number:**
356.00036, .00037

### Pull-off registration for Liracos

**Material:**
- Cable: Kevlar
- Fittings: Al

**Force:**
\[ F_{adm} (kN) = 13 \]

**Note:**
- Length L min. 0,30 m
- Length L max. 3,40 m
- Available in steps of 0,05 m. Other cable lengths available on request.

**Drawing number:**
356.00048

**Ordering information:**
- Length 1,45 m
  
  2177.145 Pull-off registration for Liracos
**2178**  
**Steady arm tube suspension cable for Liracos**

- **Material:**
  - Cable: Kevlar
  - Fittings: Al

- **Note:**
  - Length L min. 0,50 m
  - Length L max. 2,40 m
  - Available in steps of 0,10 m.

- **Drawing number:**
  - 356.00049

- **Ordering information:**
  - Length 1,50 m
  - 2178.150 Steady arm tube suspension cable for Liracos

---

**2179**  
**Adapter for Liracos top tube on stand off brackets for steady arm**

- **Note:**
  - Adaptor for fitting the top tube to bracket 2173 5431

- **Drawing number:**
  - 356.00071

- **Ordering information:**
  - 2179 Adaptor for Liracos top tube on stand off brackets for steady arm
Tubular cantilever over one track with delta suspension

Tubular cantilever over two tracks with delta suspension
Tubular cantilever over one track with drop bracket for steady arm

Tubular cantilever over two tracks with drop bracket for steady arm
Tubular cantilever over one track with flat laying steady arm

Tubular cantilever over two tracks with flat laying steady arm
Cross span with delta suspension

Cross span with flat laying steady arm

Cross span with contact wire clamp, direct

Cross span straight

Cross span Y-Type
### Material:
- Bracket: Fe stainless
- Eye fitting: Fe galvanized

### Mast range:
- Section HEB: 160, 180 - 240, 260

### Type Used for:
- 1: for cantilever tube
- 2: for 1 anchor cable
- 3: for 2 anchor cable

### Fasteners:
Supplied complete with U-Bolt.

### Associated parts:
- Cantilever tube: 2185
- Anchor cable: 2186

### Drawing number:
353.00368, .00386, .00768 - .00771

### Ordering information:
for cantilever on HEB 200
2181.1.20 Bracket for cantilever tube on mast HEB

---

<table>
<thead>
<tr>
<th>Type</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>for cantilever tube</td>
</tr>
<tr>
<td>2</td>
<td>for 1 anchor cable</td>
</tr>
<tr>
<td>3</td>
<td>for 2 anchor cable</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Material</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bracket</td>
<td>Fe stainless</td>
<td></td>
</tr>
<tr>
<td>Eye fitting</td>
<td>Fe galvanized</td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Mast range</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Section HEB</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td></td>
<td>180 - 240</td>
<td></td>
</tr>
<tr>
<td></td>
<td>260</td>
<td></td>
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</table>

---

<table>
<thead>
<tr>
<th>Drawing number</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>353.00368</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.00386</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.00768 - .00771</td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Ordering information</th>
</tr>
</thead>
<tbody>
<tr>
<td>for cantilever on HEB 200</td>
</tr>
<tr>
<td>2181.1.20 Bracket for cantilever tube on mast HEB</td>
</tr>
</tbody>
</table>
**Bracket for cantilever tube, on tubular pole**

---

**Material:**
- Bracket: Fe stainless
- Eye fitting: Fe galvanized

**Type** | **Used for**
--- | ---
1 | for cantilever tube
2 | for 1 anchor cable
3 | for 2 anchor cable

<table>
<thead>
<tr>
<th>Pole range</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>(mm)</td>
<td>(mm)</td>
</tr>
<tr>
<td>180</td>
<td>180 - 260</td>
</tr>
<tr>
<td>260</td>
<td>260 - 300</td>
</tr>
<tr>
<td>300</td>
<td>300 - 440</td>
</tr>
</tbody>
</table>

**Fasteners:**
Supplied complete with band bracket.

**Associated parts:**
- Cantilever tube 2185
- Anchor cable 2186

**Drawing number:**
353.00369, 00388, 00389

**Ordering information:**
for 1 anchor cable on tubular pole ø 200 mm
2182.2.180 Bracket for cantilever tube, on tubular pole
Bracket for 2 cantilever tubes, on mast HEB

Type Used for
1 for cantilever tube
2 for 1 anchor cable
3 for 2 anchor cable

Material:
Bracket Fe stainless
Eye fitting Fe galvanized

Mast range:
Section HEB 160
180 - 240
260

Fasteners:
Supplied complete with U-Bolt.

Associated parts:
Cantilever tube 2185
Anchor cable 2186

Drawing number:
353.00370, .00390, .00391, .00641, .00642, .00644 - .00647

Ordering information:
for 1 anchor cable on HEB 200
2183.2.20 Bracket for 2 cantilever tubes, on mast HEB
Bracket for 2 cantilever tubes, on tubular pole

**Material:**
- Bracket: Fe stainless
- Eye fitting: Fe galvanized

**Type Used for**
- 1 for cantilever tube
- 2 for 1 anchor cable
- 3 for 2 anchor cable

**Pole range d**

<table>
<thead>
<tr>
<th>Pole range</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>(mm)</td>
<td>(mm)</td>
</tr>
<tr>
<td>180</td>
<td>180 - 260</td>
</tr>
<tr>
<td>260</td>
<td>260 - 300</td>
</tr>
<tr>
<td>300</td>
<td>300 - 440</td>
</tr>
</tbody>
</table>

**Fasteners:**
Supplied complete with band bracket.

**Associated parts:**
- Cantilever tube 2185
- Anchor cable 2186

**Drawing number:**
353.00371, .00392, .00393

**Ordering information:**
for 2 anchor cables on tubular pole ø 200 mm
2184.3.180 Bracket for 2 cantilever tubes, on tubular pole
Material:
Insulation      Synthetic material
Tube            Fe galvanized

Force:
F_{adm} (kN) = 5

Note:
M_{adm} (Nm) on Insulator fastening = 180
Length L min. 5,0 m
Length L max. 12,0 m
Available in steps of 0,5 m.
Other lengths available on request.
In case of double insulation (2187) 3 kV.

Associated parts:
Insulating anchor cable  2186
Insulated suspension for tube 2187
Bracket for cantilever tube 2181 o/w

Drawing number:
353.00365

Ordering information:
Length L = 8,5 m
2185.085 Cantilever tube with insulator to bracket,
1,5 kV

---

Material:
Cable          Kevlar
Fittings       Al
Turnbuckle     Fe galvanized

Force:
F_{adm} (kN) = 13

Note:
Length L min. 1,0 m
Length L max. 15,0 m
Other cable lengths available on request.

Drawing number:
353.00394

Ordering information:
Length L = 8,5 m
2186.08500 Insulating anchor cable
with turnbuckle
Insulated suspension for tube ø 55 and ø 70 mm, 3 kV

**Material:**
- **Insulation:** Synthetic material
- **Fittings:** Fe stainless

<table>
<thead>
<tr>
<th>Type</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>with clamp for stitch wire for cable ø 6 mm</td>
</tr>
<tr>
<td>2.1</td>
<td>with clamp for stitch wire for cable ø 6 mm</td>
</tr>
<tr>
<td>2.2</td>
<td>with pulley for kevlar rope ø 10 mm</td>
</tr>
<tr>
<td>3</td>
<td>with hinged rope clamp</td>
</tr>
<tr>
<td>4</td>
<td>with contact wire swivel clip, groove type</td>
</tr>
<tr>
<td>5</td>
<td>for steady arm tube</td>
</tr>
<tr>
<td>6</td>
<td>with eyebolt for suspension, delta cable</td>
</tr>
<tr>
<td>7</td>
<td>with feeder line suspension</td>
</tr>
</tbody>
</table>

**Force:**
- \( F_{adm1} (kN) = 1 \)
- \( F_{adm2} (kN) = 4 \)

**Note:**
- When ordering state tube diameter.
- Standard diameters 55 and 70 mm

**Fasteners:**
- Supplied complete with U-Bolts.

**Associated parts:**
- Hinged rope clamp 5351
- Contact wire swivel clip 5552b/w
- Steady arm tube with eye end fitting 5523
- Delta cable 5565b/w

**Drawing number:**
- 353.00351 - .00351-6, 353.00402 - .00402-6

**Ordering information:**
- On tube ø 70 mm, with contact wire swivel clip, groove type
- 2187.70.4 Insulated suspension for tube ø 55 and 70 mm, 3 kV
**Material:**
- Insulation: Synthetic material
- Fittings: Fe stainless

**Type** | **Used for**
---|---
1 | with delta cable clamp for cable ø 6 mm
2.1 | with pulley for steel cable ø 6 mm
2.2 | with pulley for Kevlar rope ø 10 mm
3 | with hinged rope clamp
4 | with contact wire swivel clip, groove type
5 | for steady arm tube
6 | with eyebolt for suspension, delta cable
7 | with feeder line suspension

**Force:**
- $F_{adm1}$ (kN) = 1
- $F_{adm2}$ (kN) = 2

**Note:**
on cross span ø 4.5 - 9 mm / 35 - 50 mm²

**Associated parts:**
- Hinged rope clamp 5351
- Contact wire swivel clip 5552o/w
- Steady arm tube with eye end fitting 5523
- Delta cable 5565o/w

**Drawing number:**
353.00353 - .00353-6

**Ordering information:**
with hinged rope clamp
2188.3 Insulated suspension for cross span, short, 3 kV
**2189**  
**Insulated suspension for cross span, long, 3 kV**

<table>
<thead>
<tr>
<th>Material:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation</td>
</tr>
<tr>
<td>Fittings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>with delta cable clamp for cable Ø 6 mm</td>
</tr>
<tr>
<td>2.1</td>
<td>with pulley for steel cable Ø 6 mm</td>
</tr>
<tr>
<td>2.2</td>
<td>with pulley for Kevlar rope Ø 10 mm</td>
</tr>
<tr>
<td>3</td>
<td>with hinged rope clamp</td>
</tr>
<tr>
<td>4</td>
<td>with contact wire swivel clip, groove type</td>
</tr>
<tr>
<td>5</td>
<td>for steady arm tube</td>
</tr>
<tr>
<td>6</td>
<td>with eyebolt for suspension, delta cable</td>
</tr>
<tr>
<td>7</td>
<td>with feeder line suspension</td>
</tr>
</tbody>
</table>

**Force:**

\[
F_{adm1} (\text{kN}) = 1 \\
F_{adm2} (\text{kN}) = 4
\]

**Note:**
on cross span Ø 4,5 - 9 mm / 35 - 50 mm²

**Associated parts:**

- Hinged rope clamp 5351
- Contact wire swivel clip 5552 o/w
- Steady arm tube with eye end fitting 5523
- Delta cable 5565 o/w

**Drawing number:**

353.00352 - .00352-6

**Ordering information:**

with pulley for Kevlar rope Ø 10 mm

2189.2.2 Insulated suspension for cross span, long, 3 kV
Suspension pulley for light rail system 2189.2

Ordering information:
2189.2 Suspension pulley for light rail system

Material:
- Insulation: Synthetic material
- Fittings: Fe stainless

<table>
<thead>
<tr>
<th>Type</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>with delta cable clamp for cable ø 6 mm</td>
</tr>
<tr>
<td>2.1</td>
<td>with pulley for steel cable ø 6 mm</td>
</tr>
<tr>
<td>2.2</td>
<td>with pulley for Kevlar rope ø 10 mm</td>
</tr>
<tr>
<td>3</td>
<td>with hinged rope clamp</td>
</tr>
<tr>
<td>4</td>
<td>with pin ø 10 mm</td>
</tr>
</tbody>
</table>

Note:
for kevlar cross span ø 10 mm

Associated parts:
- Hinged rope clamp 5351

Drawing number:
353.00397, .00397-2, .00397-3, .00397-5

Ordering information:
- with pulley for Kevlar rope ø 10 mm
  2190.2.2 Insulated suspension for Kevlar cross span

Insulated suspension for kevlar cross span 2190

Material:
- Insulation: Synthetic material
- Fittings: Fe stainless

Drawing number:
448.00027

Ordering information:
2189.2 Suspension pulley for light rail system
### U-bolt for spread cantilever

**Type** | **Section (mm)** | **A (mm)** | **B (mm)** | **C (mm)**
---|---|---|---|---
16 | 160 | 170 | 192 | 186
18 | 180 | 191 | 212 | 207
20 | 200 | 211 | 232 | 227
22 | 220 | 232 | 252 | 248
24 | 240 | 253 | 272 | 269
26 | 260 | 274 | 292 | 290

**Drawing number:**
359.00036

**Ordering information:**
on HEB 220
2191.22 U-bolt for spread cantilever

---

### U-bolt for spread cantilever on wooden pole

**Type** | **Pole range (mm)** | **A (mm)** | **B (mm)** | **C (mm)**
---|---|---|---|---
15 | 150 - 200 | 211 | 138 | 227
18 | 180 - 200 | 211 | 138 | 227
19 | 190 - 245 | 253 | 162 | 269
21 | 210 - 225 | 232 | 160 | 248

**Drawing number:**
359.00025

**Ordering information:**
on wooden pole ø 175 mm
2192.15 U-bolt for spread cantilever on wooden pole

---

### Compression clamp for horizontal cantilever on wooden pole

**Mast range:**
Wooden pole ø 150 - 255

**Drawing number:**
359.00026

**Ordering information:**
2194 Compression clamp for horizontal cantilever on wooden pole
**2195 Mast bracket for tubular cantilever**

- **Mast range:**
  - Section HEB 160 - 260

- **Drawing number:**
  - 354.00022

- **Ordering information:**
  - on HEB 220
  - 2195.22 Mast bracket for tubular cantilever

**2196 Hinged suspension in cross span**

- **Material:**
  - Rope Fe A2
  - Fittings Fe A2

- **Type L (mm):**
  - 03 300
  - 04 400
  - 05 500
  - 06 600

- **Note:**
  - Thimble and crimp connector are delivered loose.
  - Other lengths on request.

- **Drawing number:**
  - 413.00043-1

- **Ordering information:**
  - Length 600 mm
  - 2196.06 Hinged suspension in cross span

**2197 Contact wire support Delta**

- **Material:**
  - Fe A2

- **Drawing number:**
  - 413.00043

- **Ordering information:**
  - 2197 Contact wire support Delta
<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>030</td>
<td>3.0</td>
<td>304</td>
</tr>
<tr>
<td>035</td>
<td>3.5</td>
<td>345</td>
</tr>
<tr>
<td>040</td>
<td>4.0</td>
<td>386</td>
</tr>
<tr>
<td>045</td>
<td>4.5</td>
<td>427</td>
</tr>
<tr>
<td>050</td>
<td>5.0</td>
<td>468</td>
</tr>
<tr>
<td>055</td>
<td>5.5</td>
<td>509</td>
</tr>
<tr>
<td>060</td>
<td>6.0</td>
<td>550</td>
</tr>
<tr>
<td>065</td>
<td>6.5</td>
<td>591</td>
</tr>
<tr>
<td>070</td>
<td>7.0</td>
<td>632</td>
</tr>
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</table>

**Note:**
Dimensioning by F+F

**Associated parts:**
Drop tube 21103 o/w

**Drawing number:**
342.00201

**Ordering information:**
Type 050, length 5.0 m
21101.050 TTC-Boom
<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>070</td>
<td>7,0</td>
<td>947</td>
</tr>
<tr>
<td>075</td>
<td>7,5</td>
<td>1002</td>
</tr>
<tr>
<td>080</td>
<td>8,0</td>
<td>1057</td>
</tr>
<tr>
<td>085</td>
<td>8,5</td>
<td>1112</td>
</tr>
<tr>
<td>090</td>
<td>9,0</td>
<td>1166</td>
</tr>
<tr>
<td>095</td>
<td>9,5</td>
<td>1221</td>
</tr>
<tr>
<td>100</td>
<td>10,0</td>
<td>1276</td>
</tr>
<tr>
<td>105</td>
<td>10,5</td>
<td>1331</td>
</tr>
</tbody>
</table>

Note: Dimensioning by F+F

Associated parts:
Drop tube 21103 o/w

Drawing number: 342.00300

Ordering information:
Type 085, length 8,5 m
21102.085 TTC-Boom long
### Drop tube on TTC

**Type L (mm)**

<table>
<thead>
<tr>
<th>Type</th>
<th>L</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>2400</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>2800</td>
<td></td>
</tr>
</tbody>
</table>

**Fasteners:**
Supplied complete with attachment brackets and hook bolts.

**Drawing number:**
523.00788

**Ordering information:**
Type 20, length 2000 mm
21103.20 Drop tube on TTC

### Double drop tube on TTC

**Type L (mm)**

<table>
<thead>
<tr>
<th>Type</th>
<th>L</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>2400</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>2800</td>
<td></td>
</tr>
</tbody>
</table>

**Fasteners:**
Supplied complete with attachment brackets and hook bolts.

**Drawing number:**
523.00789

**Ordering information:**
Type 24, length 2400 mm
21104.24 Double drop tube on TTC
### 21105 Triple drop tube on TTC

- **Type L (mm)**
  - 20: 2000
  - 24: 2400
  - 28: 2800

- **Fasteners:**
  Supplied complete with attachment brackets and hook bolts.

- **Drawing number:**
  523.00790

- **Ordering information:**
  Type 28, length 2800 mm
  21105.28 Triple drop tube on TTC

### 21106 Ties/Struts for drop tube 120 x 120 on TTC and TTC long

- **Drawing number:**
  372.00588

- **Ordering information:**
  21106 Ties/Struts for drop tube 120 x 120 on TTC and TTC long

### 21107 Ties/Struts for double drop tube 120 x 120 on TTC and TTC long

- **Drawing number:**
  372.00589

- **Ordering information:**
  21107 Ties/Struts for double drop tube 120 x 120 on TTC and TTC long
Type | L (mm)
--- | ---
04 | 405
06 | 625
08 | 815

Drawing number:
372.00390, .00393, .00395

Ordering information:
Type 04, length 405 mm
21201.04 Hinged stand-off bracket on tube 120 x 120
Mast range:
Section HEB  200 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
<th>13</th>
<th>1310</th>
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<tbody>
<tr>
<td>19</td>
<td>1900</td>
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<td>24</td>
<td>2425</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>3125</td>
<td></td>
<td></td>
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</table>

Drawing number:
372.00474, .00476, .00479, .00480

Ordering information:
Type 19, mast HEB 200
21301.19.20 SIC on mast

Mast range:
Section HEB  200 - 260

Drawing number:
329.00029, 372.00474, .00476, .00479, .00480

Ordering information:
Mast HEB 240
21302.24
Double SIC on mast
21303 Frame for double SIC

Associated parts:
For double SIC on Mast  21302

Drawing number:
329.00069

Ordering information:
21303 Frame for double SIC

MSH 150/100

MSH 200/200

1400 (1800)

1740
System sheet support with reduced system height, on drop tube 120 x 120

21400
**Spacer 21401**

<table>
<thead>
<tr>
<th>Type L (mm)</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250</td>
<td>300</td>
<td>350</td>
<td>400</td>
<td>450</td>
</tr>
</tbody>
</table>

Drawing number: 371.00162-3

Ordering information:
Length 250 mm
21401.25 Spacer

**Cantilever tube ø 70 21402**

Material:
Fe stainless

<table>
<thead>
<tr>
<th>Type L (mm)</th>
<th>09</th>
<th>11</th>
<th>13</th>
<th>15</th>
<th>17</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>900</td>
<td>1100</td>
<td>1300</td>
<td>1500</td>
<td>1700</td>
<td>1900</td>
</tr>
</tbody>
</table>

Note:
For SIC on mast 21301

Drawing number: 371.00293

Ordering information:
21402 Cantilever tube ø 70
<table>
<thead>
<tr>
<th>Type</th>
<th>Gantry</th>
<th>L (m)</th>
<th>B (mm)</th>
<th>H (mm)</th>
<th>Upper boom angle (mm)</th>
<th>Lower boom angle (mm)</th>
<th>Greatest part length (m)</th>
<th>Wt (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>J 60</td>
<td>8,0 - 16,0</td>
<td>380</td>
<td>400</td>
<td>60 / 6</td>
<td>60 / 6</td>
<td>-</td>
<td>29</td>
</tr>
<tr>
<td>70</td>
<td>J 70</td>
<td>12,5 - 20,0</td>
<td>400</td>
<td>400</td>
<td>70 / 7</td>
<td>70 / 7</td>
<td>-</td>
<td>38</td>
</tr>
<tr>
<td>80</td>
<td>J 80</td>
<td>16,0 - 23,5</td>
<td>420</td>
<td>400</td>
<td>80 / 8</td>
<td>80 / 8</td>
<td>14,3</td>
<td>49</td>
</tr>
<tr>
<td>90</td>
<td>J 90</td>
<td>20,0 - 26,5</td>
<td>440</td>
<td>500</td>
<td>90 / 9</td>
<td>90 / 9</td>
<td>18,8</td>
<td>62</td>
</tr>
<tr>
<td>100</td>
<td>J 100</td>
<td>20,0 - 29,5</td>
<td>600</td>
<td>600</td>
<td>100 / 10</td>
<td>100 / 10</td>
<td>20,2</td>
<td>97</td>
</tr>
<tr>
<td>120</td>
<td>J 120</td>
<td>23,0 - 32,0</td>
<td>640</td>
<td>600</td>
<td>120 / 12</td>
<td>120 / 12</td>
<td>20,2</td>
<td>97</td>
</tr>
<tr>
<td>130</td>
<td>J 130</td>
<td>27,0 - 34,5</td>
<td>660</td>
<td>700</td>
<td>130 / 12</td>
<td>130 / 12</td>
<td>19,9</td>
<td>114</td>
</tr>
<tr>
<td>130 / 8</td>
<td>J 130 / 8</td>
<td>32,0 - 37,0</td>
<td>860</td>
<td>800</td>
<td>130 / 12</td>
<td>130 / 12</td>
<td>14,2</td>
<td>128</td>
</tr>
<tr>
<td>140 / 9</td>
<td>J 140 / 9</td>
<td>36,0 - 40,0</td>
<td>880</td>
<td>900</td>
<td>140 / 13</td>
<td>140 / 13</td>
<td>17,2</td>
<td>152</td>
</tr>
</tbody>
</table>

**Note:**
Dimensioning by F+F.
Beams are supplied ready assembled.

**Joint type**
J 80 - J 130 one spliced joints
J 130 / 8 - J 140 / 9 two HV joints

**Length grading:**
Available in steps of 0,50 m.

**Support:**
J 60 Upper and lower boom 2244
J 70 - J 90
Upper boom / Lower boom 2244 / 2245
J 100 - J 130
Upper and lower boom 2246
J 130 / 8 - J 140 / 9
according to local conditions

**Drawing number:**
342.00093 - .00099, .00142, .00143

**Ordering information:**
J 90 / Length 22,0 m
2221.090.220 Gantry beam with parallel ends, single beam
<table>
<thead>
<tr>
<th>Type</th>
<th>Gantry</th>
<th>L (m)</th>
<th>B (mm)</th>
<th>H (mm)</th>
<th>Upper boom angle (mm)</th>
<th>Lower boom angle (mm)</th>
<th>Greatest part length (m)</th>
<th>Wt (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>J 60</td>
<td>8,0 - 16,0</td>
<td>380</td>
<td>400</td>
<td>60 / 6</td>
<td>60 / 6</td>
<td>-</td>
<td>29</td>
</tr>
<tr>
<td>70</td>
<td>J 70</td>
<td>12,5 - 20,0</td>
<td>400</td>
<td>400</td>
<td>70 / 7</td>
<td>70 / 7</td>
<td>-</td>
<td>38</td>
</tr>
<tr>
<td>80</td>
<td>J 80</td>
<td>16,0 - 23,5</td>
<td>420</td>
<td>400</td>
<td>80 / 8</td>
<td>80 / 8</td>
<td>14,3</td>
<td>49</td>
</tr>
<tr>
<td>90</td>
<td>J 90</td>
<td>20,0 - 26,5</td>
<td>440</td>
<td>500</td>
<td>90 / 9</td>
<td>90 / 9</td>
<td>18,8</td>
<td>62</td>
</tr>
<tr>
<td>100</td>
<td>J 100</td>
<td>20,0 - 29,5</td>
<td>600</td>
<td>600</td>
<td>100 / 10</td>
<td>100 / 10</td>
<td>19,5</td>
<td>73</td>
</tr>
<tr>
<td>120</td>
<td>J 120</td>
<td>23,0 - 32,0</td>
<td>640</td>
<td>600</td>
<td>120 / 12</td>
<td>120 / 12</td>
<td>20,2</td>
<td>97</td>
</tr>
<tr>
<td>130</td>
<td>J 130</td>
<td>27,0 - 34,5</td>
<td>660</td>
<td>700</td>
<td>130 / 12</td>
<td>120 / 80 / 10</td>
<td>19,9</td>
<td>114</td>
</tr>
<tr>
<td>130 / 8</td>
<td>J 130 / 8</td>
<td>32,0 - 37,0</td>
<td>860</td>
<td>800</td>
<td>130 / 12</td>
<td>120 / 80 / 12</td>
<td>14,2</td>
<td>128</td>
</tr>
<tr>
<td>140 / 9</td>
<td>J 140 / 9</td>
<td>36,0 - 40,0</td>
<td>880</td>
<td>900</td>
<td>140 / 13</td>
<td>120 / 12</td>
<td>17,2</td>
<td>152</td>
</tr>
</tbody>
</table>

**Note:**
- Dimensioning by F+F.
- Beams are supplied ready assembled.
- Joint type
  - J 80 - J 130: one spliced joints
  - J 130 / 8 - J 140 / 9: two HV joints
- Length grading:
  - Available in steps of 0,50 m.

**Support:**
- J 60
  - Upper and lower boom: TAB>2244
- J 70 - J 90
  - Upper boom / Lower boom: 2244 / 2245
- J 100 - J 130
  - Upper and lower boom: 2246
- J 130 / 8 - J 140 / 9
  - According to local conditions

**Drawing number:**
- 342.00093 - .00099, .00142, .00143

**Ordering information:**
- J 120 / Length 32,0 m
- 2222.120.320 Gantry beam with parallel ends, outside beam
### Type J Gantry beam with parallel ends, centre beam

<table>
<thead>
<tr>
<th>Type</th>
<th>Gantry</th>
<th>L (mm)</th>
<th>B (mm)</th>
<th>H (mm)</th>
<th>Upper boom angle (mm)</th>
<th>Lower boom angle (mm)</th>
<th>Greatest part length (m)</th>
<th>Wt (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>J 60</td>
<td>8,0 - 16,0</td>
<td>380</td>
<td>400</td>
<td>60 / 6</td>
<td>60 / 6</td>
<td>-</td>
<td>29</td>
</tr>
<tr>
<td>70</td>
<td>J 70</td>
<td>12,5 - 20,0</td>
<td>400</td>
<td>400</td>
<td>70 / 7</td>
<td>70 / 7</td>
<td>-</td>
<td>38</td>
</tr>
<tr>
<td>80</td>
<td>J 80</td>
<td>16,0 - 23,5</td>
<td>420</td>
<td>400</td>
<td>80 / 8</td>
<td>80 / 8</td>
<td>14,3</td>
<td>49</td>
</tr>
<tr>
<td>90</td>
<td>J 90</td>
<td>20,0 - 26,5</td>
<td>440</td>
<td>500</td>
<td>90 / 9</td>
<td>90 / 9</td>
<td>18,8</td>
<td>62</td>
</tr>
<tr>
<td>100</td>
<td>J 100</td>
<td>20,0 - 29,5</td>
<td>600</td>
<td>600</td>
<td>100 / 10</td>
<td>100 / 10</td>
<td>19,5</td>
<td>73</td>
</tr>
<tr>
<td>120</td>
<td>J 120</td>
<td>23,0 - 32,0</td>
<td>640</td>
<td>600</td>
<td>120 / 12</td>
<td>120 / 12</td>
<td>20,2</td>
<td>97</td>
</tr>
<tr>
<td>130</td>
<td>J 130</td>
<td>27,0 - 34,5</td>
<td>660</td>
<td>700</td>
<td>130 / 12</td>
<td>120 / 80 / 10</td>
<td>19,9</td>
<td>114</td>
</tr>
<tr>
<td>130 / 8</td>
<td>J 130 / 8</td>
<td>32,0 - 37,0</td>
<td>860</td>
<td>800</td>
<td>130 / 12</td>
<td>120 / 80 / 12</td>
<td>14,2</td>
<td>128</td>
</tr>
<tr>
<td>140 / 9</td>
<td>J 140 / 9</td>
<td>36,0 - 40,0</td>
<td>880</td>
<td>900</td>
<td>140 / 13</td>
<td>120 / 12</td>
<td>17,2</td>
<td>152</td>
</tr>
</tbody>
</table>

**Note:**
- Dimensioning by F+F.
- Beams are supplied ready assembled.
- **Joint type**
  - J 80 - J 130 one spliced joints
  - J 130 / 8 - J 140 / 9 two HV joints
- **Length grading:**
  - Available in steps of 0,50 m.

**Support:**
- J 60
  - Upper and lower boom 2244
  - Upper boom / Lower boom 2244 / 2245
  - Upper and lower boom 2246
  - J 100 / J 130 according to local conditions

**Drawing number:**
- 342.00093, .00099, .00142, .00143

**Ordering information:**
- J 130 / Length 28,5 m
  - 2223.130.285 Gantry beam with parallel ends, centre beam
Termination beam for tensile force 7.5 kN, 1-3 terminations

<table>
<thead>
<tr>
<th>Type (mm)</th>
<th>Section (mm)</th>
<th>L (m)</th>
<th>Terminations</th>
<th>F (kN)</th>
<th>Wt (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>120</td>
<td>5,0 - 8,0</td>
<td>1</td>
<td>7,5</td>
<td>28,0</td>
</tr>
<tr>
<td>140</td>
<td>140</td>
<td>8,5 - 10,0</td>
<td>2</td>
<td>7,5</td>
<td>43,0</td>
</tr>
<tr>
<td>160</td>
<td>160</td>
<td>10,5 - 12,0</td>
<td>2</td>
<td>7,5</td>
<td>49,0</td>
</tr>
<tr>
<td>180</td>
<td>180</td>
<td>12,5 - 13,5</td>
<td>3</td>
<td>7,5</td>
<td>56,0</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
<td>14,0 - 15,0</td>
<td>3</td>
<td>7,5</td>
<td>62,0</td>
</tr>
<tr>
<td>220</td>
<td>220</td>
<td>15,5 - 16,5</td>
<td>3</td>
<td>7,5</td>
<td>71,0</td>
</tr>
<tr>
<td>240</td>
<td>240</td>
<td>17,0 - 18,5</td>
<td>3</td>
<td>7,5</td>
<td>79,0</td>
</tr>
</tbody>
</table>

**Note:**
Dimensioning by F+F.
1 = 1 Termination
2 = 2 Terminations
3 = 3 Terminations

**Length grading:**
Available in steps of 0.50 m.
Other lengths available on request.

**Associated parts:**
Support 2271 o/w
Bracket for termination 3224 o/w
Hinged termination bracket 2277
Counterweight wheel 2276

**Drawing number:**
361.00151 - .00157

**Ordering information:**
Section 120 mm, Length 7.5 m
2231.120.075 Termination beam for tensile force 7.5 kN, 1-3 terminations
### Termination beam for tensile force 12 kN, 1-3 terminations

<table>
<thead>
<tr>
<th>Type</th>
<th>Section</th>
<th>L (m)</th>
<th>Terminations</th>
<th>F (kN)</th>
<th>Wt (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>120</td>
<td>5.0 - 7.5</td>
<td>1</td>
<td>12.0</td>
<td>28.0</td>
</tr>
<tr>
<td>140</td>
<td>140</td>
<td>8.0</td>
<td>1</td>
<td>12.0</td>
<td>43.0</td>
</tr>
<tr>
<td>160</td>
<td>160</td>
<td>8.5</td>
<td>2</td>
<td>12.0</td>
<td>49.0</td>
</tr>
<tr>
<td>180</td>
<td>180</td>
<td>9.0 - 10.5</td>
<td>2</td>
<td>12.0</td>
<td>56.0</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
<td>11.0 - 12.0</td>
<td>2</td>
<td>12.0</td>
<td>62.0</td>
</tr>
<tr>
<td>220</td>
<td>220</td>
<td>12.5 - 13.5</td>
<td>3</td>
<td>12.0</td>
<td>71.0</td>
</tr>
<tr>
<td>240</td>
<td>240</td>
<td>14.0 - 15.0</td>
<td>3</td>
<td>12.0</td>
<td>79.0</td>
</tr>
</tbody>
</table>

**Note:**
Dimensioning by F+F.
1 = 1 Termination
2 = 2 Terminations
3 = 3 Terminations

**Length grading:**
Available in steps of 0.50 m.
Other lengths available on request.

**Associated parts:**
- Support: 2271 o/w
- Bracket for termination: 3224 o/w
- Hinged termination bracket: 2277
- Counterweight wheel: 2276

**Drawing number:**
361.00151 - .00157

**Ordering information:**
Section 180 mm, Length 10.0 m
2232.180.100 Termination beam for
tensile force 12 kN, 1-3 terminations
### Termination beam for tensile force 16 kN, 1-2 terminations

**Type** | **Section (mm)** | **L (m)** | **Terminations** | **F (kN)** | **Wt (kg/m)**
--- | --- | --- | --- | --- | ---
120 | 120 | 5.0 - 5.5 | 1 | 16.0 | 28.0
140 | 140 | 6.0 - 8.0 | 1 | 16.0 | 43.0
200 | 200 | 8.5 - 10.0 | 2 | 16.0 | 62.0
220 | 220 | 10.5 - 12.0 | 2 | 16.0 | 71.0
240 | 240 | 12.5 - 13.0 | 2 | 16.0 | 79.0

**Note:**
- Dimensioning by F+F.
- 1 = 1 Termination
- 2 = 2 Terminations

**Length grading:**
- Available in steps of 0.50 m.
- Other lengths available on request.

**Associated parts:**
- Support 2271 o/w
- Bracket for termination 3224 o/w
- Hinged termination bracket 2277
- Counterweight wheel 2276

**Drawing number:**
- 361.00151 - .00157

**Ordering information:**
- Section 240 mm, Length 12.5 m
- 2233.240.125 Termination beam for tensile force 16 kN, 1-2 terminations

---

**Diagram:**
- Profil UNP
- Dimensioning by F+F.
- 1 = 1 Termination
- 2 = 2 Terminations

---

**Termination beam for tensile force 16 kN, 1-2 terminations**
Double support bracket for gantry beam

Mast range:
Section HEB
160 L = 240 mm
180 L = 260 mm
200 L = 280 mm
220 L = 300 mm
240 L = 320 mm
260 L = 340 mm

Note:
M = M 16 crooked

Fasteners:
Supplied complete with long shank bolts.

Drawing number:
433.00008

Ordering information:
on HEB 240
2243.24 Double support bracket for gantry beam

Support bracket for gantry beam J 60 - 90 with parallel ends

Mast range:
Section HEB
160 - 260

Fasteners:
Supplied complete with U-bolts.

Drawing number:
433.00074

Ordering information:
on HEB 240
2244.24 Support bracket for gantry beam J 60 - 90 parallel ends

Support bracket for gantry beam J 70 - 90 with parallel ends

Mast range:
Section HEB
160 - 260

Fasteners:
Supplied complete with U-bolts.

Drawing number:
433.00074

Ordering information:
on HEB 200
2245.20 Support bracket for gantry beam J 70 - 90 with parallel ends
Support bracket for gantry beam J 100 - 130 with parallel ends

Mast range:
Section HEB 160 - 260

Fasteners:
Supplied complete with U-bolts.

Drawing number:
433.00075

Ordering information:
on HEB 240
2246.24 Support bracket for gantry beam J 100 - 130 with parallel ends
### Drop bracket for gantry beam

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
<th>Gantry (mm)</th>
<th>T (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.1</td>
<td>2700</td>
<td>60 - 90</td>
<td>2115</td>
<td>234</td>
</tr>
<tr>
<td>27.2</td>
<td>2700</td>
<td>100 - 130</td>
<td>1915</td>
<td>234</td>
</tr>
<tr>
<td>29.1</td>
<td>2950</td>
<td>60 - 90</td>
<td>2365</td>
<td>262</td>
</tr>
<tr>
<td>29.2</td>
<td>2950</td>
<td>100 - 130</td>
<td>2165</td>
<td>262</td>
</tr>
<tr>
<td>32.1</td>
<td>3200</td>
<td>60 - 90</td>
<td>2615</td>
<td>290</td>
</tr>
<tr>
<td>32.2</td>
<td>3200</td>
<td>100 - 130</td>
<td>2415</td>
<td>290</td>
</tr>
<tr>
<td>34.1</td>
<td>3450</td>
<td>60 - 90</td>
<td>2865</td>
<td>318</td>
</tr>
<tr>
<td>34.2</td>
<td>3450</td>
<td>100 - 130</td>
<td>2665</td>
<td>318</td>
</tr>
</tbody>
</table>

**Force:**

\[ F_{adm} (kN) = 7.5 \]

**Note:**

Gantry beam 2221 o/w

**Fasteners:**

Supplied complete with carrying angles and hook bolts.

**Associated parts:**

- Mast bracket
- for steady arm 5411 o/w
- Earth rope clamp 6219

**Drawing number:**

348.00122 - .00125

**Ordering information:**

Length 3,45 m, on J 120

2251.34.2 Drop bracket for gantry beam
### Upright on gantry beam

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
<th>Gantry T (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.1</td>
<td>2700</td>
<td>60 - 90</td>
<td>2115</td>
</tr>
<tr>
<td>27.2</td>
<td>2700</td>
<td>100 - 130</td>
<td>1915</td>
</tr>
<tr>
<td>28.1</td>
<td>2950</td>
<td>60 - 90</td>
<td>2365</td>
</tr>
<tr>
<td>28.2</td>
<td>2950</td>
<td>100 - 130</td>
<td>2165</td>
</tr>
<tr>
<td>32.1</td>
<td>3200</td>
<td>60 - 90</td>
<td>2615</td>
</tr>
<tr>
<td>32.2</td>
<td>3200</td>
<td>100 - 130</td>
<td>2415</td>
</tr>
<tr>
<td>34.1</td>
<td>3450</td>
<td>60 - 90</td>
<td>2865</td>
</tr>
<tr>
<td>34.2</td>
<td>3450</td>
<td>100 - 130</td>
<td>2665</td>
</tr>
<tr>
<td>37.1</td>
<td>3700</td>
<td>60 - 90</td>
<td>3115</td>
</tr>
<tr>
<td>37.2</td>
<td>3700</td>
<td>100 - 130</td>
<td>2915</td>
</tr>
<tr>
<td>39.1</td>
<td>3950</td>
<td>60 - 90</td>
<td>3365</td>
</tr>
<tr>
<td>39.2</td>
<td>3950</td>
<td>100 - 130</td>
<td>3165</td>
</tr>
<tr>
<td>42.1</td>
<td>4200</td>
<td>60 - 90</td>
<td>3615</td>
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<td>42.2</td>
<td>4200</td>
<td>100 - 130</td>
<td>3415</td>
</tr>
<tr>
<td>46.1</td>
<td>4600</td>
<td>60 - 90</td>
<td>4015</td>
</tr>
<tr>
<td>46.2</td>
<td>4600</td>
<td>100 - 130</td>
<td>3815</td>
</tr>
<tr>
<td>52.1</td>
<td>5200</td>
<td>60 - 90</td>
<td>4615</td>
</tr>
<tr>
<td>52.2</td>
<td>5200</td>
<td>100 - 130</td>
<td>4415</td>
</tr>
</tbody>
</table>

**Force:**

$$F_{adm} = 7.5 \text{kN}$$

**Note:**

Gantry beam 2221 o/w

**Fasteners:**

Supplied complete with carrying angles and hook bolts.

**Associated parts:**

- Cross arm for upright 2253
- Cross arm for suspension 2311 o/w
- Earth rope clamp 6211
- Earth rope clamp 6219

**Drawing number:**

348.00102

**Ordering information:**

Length 3,20 m, on J 60
2252.32.1 Upright on gantry beam

### Rung for upright on gantry

**Fasteners:**

Supplied complete with square U-bolts.

**Drawing number:**

348.00012

**Ordering information:**

2253 Rung for upright on gantry
Type | L (mm) | Gantry | T (mm) | Wt (kg) | T1 (mm) | T2 (mm) | Force: F_{adm} (kN) = 7.5
-----|-------|--------|--------|---------|--------|--------|-------------------------------
63.2 | 6300  | 100 - 130 | 6215 | 272     |        |        | Note: Gantry beam 2221 o/w

Fasteners:
Supplied complete with carrying angles and hook bolts.

Associated parts:
Cross arm for suspension on request

Drawing number:
348.00055

Ordering information:
L = 6300 mm, on gantry 100 - 130
2254.63.2 Upright, strong, on gantry

Type | L (mm) | Gantry | Wt (kg) | T1 (mm) | T2 (mm) | Force: F_{adm} (kN) = 7.5
-----|-------|--------|---------|--------|--------|-------------------------------
34   | 3450  | 130/8, 140/9 | 86,9   | 2550   | 2650   | Note: Gantry beam 2221 o/w
37   | 3700  | 130/8, 140/9 | 90,5   | 2800   | 2900   |
42   | 4200  | 130/8, 140/9 | 98,7   | 3300   | 3400   |
46   | 4600  | 130/8, 140/9 | 104,7  | 3700   | 3800   |
52   | 5200  | 130/8, 140/9 | 114,2  | 4300   | 4400   |

Fasteners:
Supplied complete with carrying angles and hook bolts.

Drawing number:
348.00121, .00126 - .00129

Ordering information:
Length 5200 mm
2255.52 Upright on gantry beam
Drop bracket for gantry beam

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
<th>Gantry</th>
<th>Wt (kg)</th>
<th>T1 (mm)</th>
<th>T2 (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>3450</td>
<td>130/8, 140/9</td>
<td>86,9</td>
<td>2550</td>
<td>2650</td>
</tr>
</tbody>
</table>

Force:
\[ F_{adm} \, (kN) = 7,5 \]

Note:
Gantry beam 2221 o/w

Fasteners:
Supplied complete with carrying angles and hook bolts.

Drawing number:
348.00121

Ordering information:
Length 3450 mm
2256.34 Drop bracket for gantry beam
Drop tube for 1 tubular cantilever on gantry 2261

Type  Gantry
1    60 - 90
2    100 - 130

Note:
When ordering state length T.

Fasteners:
Supplied complete with attachment brackets and hook bolts.

Associated parts:
Mast bracket  2152
Hinged bracket  2153

Drawing number:
353.00486

Ordering information:
on J 80, length T 3,80 m
2261.1.380 Drop tube for 1 tubular cantilever on gantry

Drop tube for 2 tubular cantilevers on gantry 2262

Type  Gantry
1    60 - 90
2    100 - 130

Note:
When ordering state length T and distance A.

Fasteners:
Supplied complete with attachment brackets and hook bolts.

Associated parts:
Mast bracket  2152
Hinged bracket  2153
Anchor  2264

Drawing number:
353.00488

Ordering information:
on J 120, length T 3,80 m
distance A 0,90 m
2262.2.380.090 Drop tube for 2 tubular cantilevers on gantry
2263  Drop tube for 1 tubular cantilever on termination beam

Support range:
Profil UNP 120 - 240

Note:
When ordering state length T1, T2 and distance A.

Fasteners:
Supplied complete with attachment brackets and U-bolts.

Associated parts:
Mast bracket 2152
Hinged bracket 2153

Drawing number:
353.00346

Ordering information:
for UNP 200, T1 0,40m,
T2 2,20 m, A 1,30 m
2263.200.040.220.130 Drop tube for 1 tubular cantilever on termination beam

2264  Anchor for 2 drop tubes on gantry

Type  Gantry
1     60 - 90
2     100 - 130

Note:
When ordering state length T and distance A.

Fasteners:
Supplied complete with hook bolts and U-bolts.

Associated parts:
Supplied complete with hook bolts and U-bolts.

Drawing number:
353.00143

Ordering information:
for J 90, T 2,00m, A 0,90 m
2264.1.200.090 Anchor for 2 drop tubes on gantry
Support range:
Profil UNP 120 - 240

Note:
When ordering state length T.

Fasteners:
Supplied complete with attachment brackets and U-bolts.

Associated parts:
Tunnel support 2422

Drawing number:
353.00333

Ordering information:
for UNP 200 mm, length T 2,20 m
2265.200.220 Drop tube for 1 tunnel support on termination beam
System sheet terminations on termination beam

Counterweight tensioned contact wire and carrying cable

2274 2276, 2277

2273 2276, 2277

4331, 215, 4332

4441, 3521

4322

4323 o/w

Conterweight tensioned contact wire and carrying cable

Counterweight tensioned contact wire, fixed termination for carrying cable

2271 3224 o/w

2272 2276, 2277

2231 o/w 2282

4441, 3521

4322

4323 o/w

Counterweight tensioned carrying cable

Counterweight tensioned contact wire and carrying cable

2274 2276, 2277

2275 2150

4441, 3521

4322

4323 o/w

2422

2265

2282
**Support for termination beam**

**Mast range:**
Section HEB 180-260

**Note:**
G = Track axis
F = Pulling direction
L = left
R = right

**Fasteners:**
Supplied complete with U-bolts.

**Termination beam:**
Profil UNP 120-240

**Drawing number:**
523.00099, 523.00616

**Ordering information:**
for UNP 120, on HEB 240, left
2271.12.24.L Support for termination beam

- Mast range:
  - Section HEB 180-260

- Note:
  - Length L min. 3,00 m
  - Length L max. 5,00 m
  - Available in steps of de 0,5 m.
  - G = Track axis
  - F = Pulling direction
  - L = left
  - R = right

- Counterweight rod 4322
- Counterweight 4323 o/w

- Fasteners:
  - Supplied complete with U-bolts.

- Termination beam:
  - Profil UNP 120-240

- Consisting of:
  - Support for termination beam, complete 523.00111
  - Lower cross arm 523.00193
  - Tube for weight guide 4374
  - Spacer 4375

- Drawing number:
  - 523.00183

- Ordering information:
  - for UNP 120, on HEB 240
  - L = 4,50 m, right
  - 2272.12.24.45.R Support for termination beam with one deviation and one weight guide

---

**Support for termination beam with one deviation and one weight guide**

**Mast range:**
Section HEB 180-260

**Note:**
Length L min. 3,00 m
Length L max. 5,00 m
Available in steps of de 0,5 m.
G = Track axis
F = Pulling direction
L = left
R = right

**Counterweight rod 4322**
**Counterweight 4323 o/w**

**Fasteners:**
Supplied complete with U-bolts.

**Termination beam:**
Profil UNP 120-240

**Consisting of:**
- Support for termination beam, complete 523.00111
- Lower cross arm 523.00193
- Tube for weight guide 4374
- Spacer 4375

**Drawing number:**
523.00183

**Ordering information:**
for UNP 120, on HEB 240
L = 4,50 m, right
2272.12.24.45.R Support for termination beam with one deviation and one weight guide
Support for termination beam with one deviation and two weight guides

Mast range:
Section HEB 180-260

Note:
Length L min. 3,00 m
Length L max. 5,00 m
Available in steps of de 0,5 m.
G = Track axis
F = Pulling direction
L = left
R = right
Counterweight rod 4322
Counterweight 4323 o/w

Fasteners:
Supplied complete with U-bolts.

Termination beam:
Profil UNP 120-240

Consisting of:
Support for termination beam, complete 523.00112
Lower cross arm 523.00194
Tube for weight guide 4374
Spacer 4375

Drawing number:
523.00692, 00696, .00725 -.00727, .00735 -.00739

Ordering information:
for UNP 200, on HEB 260
L = 4,50 m, right
2273.20.26.45.R Support for termination beam with one deviation and two weight guides

Support for termination beam with one deviation

Mast range:
Section HEB 180-260

Note:
G = Track axis
F = Pulling direction
L = left
R = right

Fasteners:
Supplied complete with U-bolts.

Termination beam:
Profil UNP 120-240

Drawing number:
523.00113

Ordering information:
for UNP 220, on HEB 240, left
2274.22.24.L Support for termination beam with one deviation
Support for termination beam for one weight guides

Mast range:
Section HEB 180-260

Note:
Length L min. 3,00 m
Length L max. 5,00 m
Available in steps of de 0,5 m.
G = Track axis
F = Pulling direction
L = left
R = right
Counterweight rod 4322
Counterweight 4323 o/w

Fasteners:
Supplied complete with U-bolts.

Termination beam:
Profil UNP 120-240

Consisting of:
Support for termination beam, complete 523.00094
Lower cross arm 523.00193
Tube for weight guide 4374
Spacer 4375

Drawing number:
523.00185

Ordering information:
for UNP 120, on HEB 240
L = 4,50 m, left
2275.12.24.45.L Support for termination beam with one deviation and two weight guides

Counterweight wheel (1:3 ratio) on termination beam

Note:
Supplied complete with equalizing pulley and wedges for counterweight wheel.
G = Track axis
F = Pulling direction
L = left
R = right

Fasteners:
Supplied complete with U-bolts.

Termination beam:
Profil UNP 120-240

Drawing number:
523.00116, 00744, .00745

Ordering information:
on UNP 140, right
2276.14.R Counterweight wheel (1:3 ratio) on termination beam
Counterweight tensioning device on termination beam

Note:
Supplied complete with pulleys and clevis straps. Order the cable separately.

- **G**: Track axis
- **F**: Pulling direction
- **L**: Left
- **R**: Right

Fasteners:
Supplied complete with U-bolts.

Termination beam:
Profil UNP 120-240

Drawing number:
523.00117, .00746, .00747

Ordering information:
for UNP 120, right
2277.12.R Counterweight tensioning device on termination beam
Note:
With anchor tongue
for Mono Anchor Boom WPE 450 22706
on Tubular mast 300 x 500 RHS 1282

Drawing number:
334.00118

Ordering information:
22701 Support Bracket for
Mono Anchor Boom WPE 450

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Note:
with anchor tongue
for Mono Anchor Boom WEB 450 22705
on Rohrmast 300 x 500 WEB 450 1283

Drawing number:
334.00138

Ordering information:
22702 Support Bracket for
Mono Anchor Boom WEB 450
### 22703 Tensioning equipment fixed on Mono Anchor Boom, onesided

<table>
<thead>
<tr>
<th>Type</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WPE 450</td>
</tr>
<tr>
<td>2</td>
<td>WEB 450</td>
</tr>
</tbody>
</table>

**Drawing number:**
523.00772, .00773

**Ordering information:**
WPE 450
22703.1 Tensioning equipment fixed on Mono Anchor Boom, onesided

---

### 22704 Mono Anchor Boom WPE 450

**Drawing number:**
361.00366 - .00370, .00397 - .00399, .00451 - .00453

**Ordering information:**
Mast distance 10,5 m
22704.10500 Mono Anchor Boom WPE 450
Drawing number:
361.00529 - 00531

Ordering information:
Mast distance 24 m
21705.24000 Mono Anchor Boom WEB 450
### Bracket on Mono Anchor Boom, onesided

<table>
<thead>
<tr>
<th>Type</th>
<th>Used for</th>
<th>A (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WPE 450</td>
<td>1320</td>
</tr>
<tr>
<td>2</td>
<td>WEB 450</td>
<td>1450</td>
</tr>
</tbody>
</table>

**Associated parts:**
- Mono Anchor Boom WPE 450 22704
- Mono Anchor Boom WEB 450 22705

**Drawing number:**
- 523.00774, .00778

**Ordering information:**
- WPE 450 22711.1 Bracket on Mono Anchor Boom, onesided

---

### Bracket on Mono Anchor Boom, double sided

<table>
<thead>
<tr>
<th>Type</th>
<th>Used for</th>
<th>A (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WPE 450</td>
<td>1520</td>
</tr>
<tr>
<td>2</td>
<td>WEB 450</td>
<td>1650</td>
</tr>
</tbody>
</table>

**Associated parts:**
- Mono Anchor Boom WPE 450 22704
- Mono Anchor Boom WEB 450 22705

**Drawing number:**
- 523.00776, .00780

**Ordering information:**
- WEB 450 22712.2 Bracket on Mono Anchor Boom, double sided
### Tensioning Equipment on Mono Anchor Boom

<table>
<thead>
<tr>
<th>Type</th>
<th>Used for</th>
<th>A (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WPE 450</td>
<td>1050</td>
</tr>
<tr>
<td>2</td>
<td>WEB 450</td>
<td>1170</td>
</tr>
</tbody>
</table>

**Drawing number:**
523.00547, .00555, .00558, .00665, .00710, .00713

**Ordering information:**
WPE 450
22721.1 Tensioning Equipment on Mono Anchor Boom

---

### Tensorex C+ on tensioning equipment

<table>
<thead>
<tr>
<th>Type</th>
<th>Used for</th>
<th>Wt (kg)</th>
<th>L (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>for carrying cable</td>
<td>120 - 180</td>
<td>2.1 - 2.7</td>
</tr>
<tr>
<td>2</td>
<td>for contact wire</td>
<td>165 - 230</td>
<td>3.0 - 3.6</td>
</tr>
</tbody>
</table>

**Drawing number:**
523.00612, 525.00039, .00040

**Ordering information:**
for contact wire
22722.2 Tensorex C+ on tensioning equipment
Cross arm for suspension on termination beam 2281

Fasteners:
Supplied complete with Lindapter.

Termination beam:
Profil UNP 120-240

Drawing number:
433.00129

Ordering information:
on UNP 120
2281.12 Cross arm for suspension on termination beam

Cross arm for feeder on termination beam 2283

Note:
Insulator 5151

Fasteners:
Supplied complete with U-bolts.

Termination beam:
Profil UNP 120-240

Drawing number:
451.00177

Ordering information:
on UNP 140
2283.14 Cross arm for feeder on termination beam

Steady arm bracket on termination beam 2282

Fasteners:
Supplied complete with Lindapter.

Termination beam:
Profil UNP 120-240

Drawing number:
442.00065

Ordering information:
on UNP 140
2282.14 Steady arm bracket on termination beam
<table>
<thead>
<tr>
<th>Type</th>
<th>Gantry (mm)</th>
<th>Section (mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>260</td>
<td>160-240</td>
<td>310</td>
</tr>
<tr>
<td>28</td>
<td>280</td>
<td>260</td>
<td>325</td>
</tr>
</tbody>
</table>

**Drawing number:**
396.00003

**Ordering information:**
Strutting 260 mm

2291.26 Gantry bolt
Cross arm for suspension one-sided, straight

**Mast range:**
Section HEB 100
160
180 - 260

**Force:**
\( F_{adm} \text{ (kN)} = 2,0 \)

**Weight:**
\( Wt \text{ (kg)} = 17 \)

**Note:**
Arm can be moved sidewards on back plate.

**Fasteners:**
Supplied complete with U-bolts.

**Drawing number:**
451.00072, .00074

**Ordering information:**
on HEB 180
2311.18 Cross arm for suspension one-sided, straight

---

Cross arm for suspension one-sided, angled

**Mast range:**
Section HEB 100
160
180 - 260

**Force:**
\( F_{adm} \text{ (kN)} = 1,8 \)

**Weight:**
\( Wt \text{ (kg)} = 20 \)

**Note:**
Arm can be moved sidewards on back plate.

**Fasteners:**
Supplied complete with U-bolts.

**Drawing number:**
451.00075, .00077

**Ordering information:**
on HEB 240
2312.24 Cross arm for suspension one-sided, angled
Cross arm for suspension one-sided, straight, for two conductors

Mast range:
Profile HEB
160
180 - 240
260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
<th>A (mm)</th>
<th>Fadm (kN)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>1940</td>
<td>1340</td>
<td>1.8</td>
<td>32</td>
</tr>
</tbody>
</table>

Fasteners:
Supplied complete with U-bolts.

Drawing number:
451.00196

Ordering information:
Length 1940 mm, on HEB 240
2313.19.24 Cross arm for suspension one-sided, straight, for two conductors
Cross arm for suspension two-sided, straight

Mast range:
Section HEB
100
120
140
160
180 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
<th>( F_{adm} ) (kN)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>1340</td>
<td>7,0</td>
<td>18,5</td>
</tr>
<tr>
<td>18</td>
<td>1800</td>
<td>5,0</td>
<td>23,0</td>
</tr>
</tbody>
</table>

Note:
Arm can be moved sideways on back plate.

Fasteners:
Supplied complete with U-bolts.

Drawing number:
451.00066, .00068

Ordering information:
Length 1340 mm, on HEB 240
2321.13.24 Cross arm for suspension two-sided, straight

Cross arm for suspension two-sided, angled

Mast range:
Section HEB
100
160
180 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
<th>( F_{adm} ) (kN)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>1340</td>
<td>2,2</td>
<td>21,0</td>
</tr>
<tr>
<td>18</td>
<td>1800</td>
<td>2,0</td>
<td>25,5</td>
</tr>
</tbody>
</table>

Note:
Arm can be moved sideways on back plate.

Fasteners:
Supplied complete with U-bolts.

Drawing number:
451.00070, .00071

Ordering information:
Length 1800 mm, on HEB 220
2322.18.22 Cross arm for suspension two-sided, angled
Cross arm for pin insulator, one-sided

Mast range:
Section HEB 100
120
140
160
160 - 260

Force:
\[ F_{adm} (kN) = 2.4 \]

Weight:
\[ Wt (kg) = 16 \]

Note:
Arm can be moved sidewards on back plate.
Insulator pins 5212 o/w

Fasteners:
Supplied complete with U-bolts.

Drawing number:
451.00078, .00187

Ordering information:
on HEB 240
2331.24 Cross arm for pin insulator, one-sided

Cross arm for pin insulator, two-sided

Mast range:
Section HEB 100
120
140
160
160 - 260

Force:
\[ F_{adm} (kN) = 7.0 \]

Weight:
\[ Wt (kg) = 19.5 \]

Note:
Arm can be moved sidewards on back plate.
Insulator pins 5212 o/w

Fasteners:
Supplied complete with U-bolts.

Drawing number:
451.00080, .00188

Ordering information:
on HEB 220
2332.22 Cross arm for pin insulator, two-sided
Cross arm for feeder one-sided, on wide-flange mast

**Mast range:**
- Section HEB: 160 - 200
- 220 - 260

**Note:**
- Insulator pins: 5212 o/w

**Fasteners:**
- Supplied complete with U-bolts.

**Drawing number:**
- 567.00183

**Ordering information:**
- on HEB 220
- 2341.22 Cross arm for feeder one-sided, on wide-flange mast

---

Cross arm for feeder two-sided, on wide-flange mast

**Mast range:**
- Section HEB: 160 - 200
- 220 - 260

**Note:**
- Insulator pins: 5212 o/w

**Fasteners:**
- Supplied complete with long shank bolts.

**Drawing number:**
- 567.00184

**Ordering information:**
- on HEB 220
- 2342.22 Cross arm for feeder two-sided, on wide-flange mast
### Cross arm for feeder one-sided, on cantilever

<table>
<thead>
<tr>
<th>Type</th>
<th>Cantilever</th>
<th>L (mm)</th>
<th>L1 (mm)</th>
<th>C (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2111</td>
<td>530</td>
<td>415</td>
<td>110</td>
</tr>
<tr>
<td>2</td>
<td>2112</td>
<td>600</td>
<td>408</td>
<td>var</td>
</tr>
<tr>
<td>3</td>
<td>2113</td>
<td>530</td>
<td>375</td>
<td>190</td>
</tr>
<tr>
<td>4</td>
<td>2113.1</td>
<td>530</td>
<td>375</td>
<td>190</td>
</tr>
<tr>
<td>5</td>
<td>2114</td>
<td>530</td>
<td>410</td>
<td>120</td>
</tr>
</tbody>
</table>

**Note:**
- Insulator pins 5212 o/w
- When using insulator 5154, order washer Ø 17 / 50 x 3 A2 additionally.

**Fasteners:**
Supplied complete with long shank bolts.

**Drawing number:**
567.00187, .00191

**Ordering information:**
on cantilever 2113.1
2351.4 Cross arm for feeder one-sided, on cantilever

### Cross arm for feeder two-sided, on cantilever

<table>
<thead>
<tr>
<th>Type</th>
<th>Cantilever</th>
<th>L (mm)</th>
<th>L1 (mm)</th>
<th>C (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2111</td>
<td>800</td>
<td>740</td>
<td>110</td>
</tr>
<tr>
<td>2</td>
<td>2112</td>
<td>875</td>
<td>815</td>
<td>var</td>
</tr>
<tr>
<td>3</td>
<td>2113</td>
<td>800</td>
<td>740</td>
<td>190</td>
</tr>
<tr>
<td>4</td>
<td>2113.1</td>
<td>800</td>
<td>740</td>
<td>190</td>
</tr>
<tr>
<td>5</td>
<td>2114</td>
<td>800</td>
<td>740</td>
<td>120</td>
</tr>
</tbody>
</table>

**Note:**
- Insulator pins 5212 o/w

When using insulator 5154, order washer Ø 17 / 50 x 3 A2 additionally.

**Fasteners:**
Supplied complete with long shank bolts.

**Drawing number:**
567.00188, .00194

**Ordering information:**
on cantilever 2114
2352.5 Cross arm for feeder two-sided, on cantilever
Cross arm for feeder one-sided, on gantry beam

<table>
<thead>
<tr>
<th>Type</th>
<th>Gantry L (mm)</th>
<th>L1 (mm)</th>
<th>C (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60 - 90</td>
<td>530</td>
<td>351</td>
</tr>
<tr>
<td>2</td>
<td>100 - 130</td>
<td>720</td>
<td>471</td>
</tr>
</tbody>
</table>

Note:
- Insulator pins 5212 o/w
- When using insulator 5154, order washer ø 17 / 50 x 3 A2 additionally.

Fasteners:
- Supplied complete with hook bolts.

Drawing number:
- 567.00189

Ordering information:
- on gantry J 80
- 2353.1 Cross arm for feeder one-sided, on gantry beam

Cross arm for feeder two-sided, on gantry beam

<table>
<thead>
<tr>
<th>Type</th>
<th>Gantry L (mm)</th>
<th>L1 (mm)</th>
<th>C (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60 - 90</td>
<td>800</td>
<td>740</td>
</tr>
<tr>
<td>2</td>
<td>100 - 130</td>
<td>1000</td>
<td>940</td>
</tr>
</tbody>
</table>

Note:
- Insulator pins 5212 o/w
- When using insulator 5154, order washer ø 17 / 50 x 3 A2 additionally.

Fasteners:
- Supplied complete with hook bolts.

Drawing number:
- 567.00190

Ordering information:
- on gantry J 120
- 2354.2 Cross arm for feeder two-sided, on gantry beam
Material:
Fe stainless

Note:
Retaining clamp 3424

Fasteners:
Supplied complete with U-bolts.

Drawing number:
567.00154

Ordering information:
2355 Cross arm for cantilever
FL 200 / 260
### Termination cross arm with 2 fixed termination brackets

**Mast range:**
Section HEB 200 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.13</td>
<td>-</td>
<td>1340</td>
</tr>
<tr>
<td>1.18</td>
<td>-</td>
<td>1800</td>
</tr>
<tr>
<td>2.13</td>
<td>for post insulator</td>
<td>1340</td>
</tr>
<tr>
<td>2.18</td>
<td>for post insulator</td>
<td>1800</td>
</tr>
</tbody>
</table>

**Force:**
\[ F_{adm} (kN) = 20 \]

**Note:**
Post insulator 5151

**Fasteners:**
Supplied complete with U-bolts.

**Drawing number:**
451.00219, .00220

**Ordering information:**
Length 1340 mm, on HEB 220

*2361.1.13.22 Termination cross arm with 2 fixed termination brackets*

### Termination cross arm with 4 fixed termination brackets

**Mast range:**
Section HEB 200 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.13</td>
<td>-</td>
<td>1340</td>
</tr>
<tr>
<td>1.18</td>
<td>-</td>
<td>1800</td>
</tr>
<tr>
<td>2.13</td>
<td>for post insulator</td>
<td>1340</td>
</tr>
<tr>
<td>2.18</td>
<td>for post insulator</td>
<td>1800</td>
</tr>
</tbody>
</table>

**Force:**
\[ F_{adm} (kN) = 20 \]

**Note:**
Post insulator 5151

**Fasteners:**
Supplied complete with U-bolts.

**Drawing number:**
451.00221, .00222

**Ordering information:**
Length 1800 mm, on HEB 240

*2362.1.18.24 Termination cross arm with 4 fixed termination brackets*
Termination cross arm with 2 fixed and 2 adjustable termination brackets

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.13</td>
<td>-</td>
<td>1340</td>
</tr>
<tr>
<td>1.18</td>
<td>-</td>
<td>1800</td>
</tr>
<tr>
<td>2.13</td>
<td>for post insulator</td>
<td>1340</td>
</tr>
<tr>
<td>2.18</td>
<td>for post insulator</td>
<td>1800</td>
</tr>
</tbody>
</table>

Mast range:
Section HEB   200 - 260

Force:
$F_{adm}$ (kN) = 20

Note:
Post insulator  5151

Fasteners:
Supplied complete with U-bolts.

Drawing number:
451.00223, .00224

Ordering information:
Length 1180 mm, on HEB 260
2363.1.18.26 Termination cross arm with 2 fixed and 2 adjustable termination brackets
Elastic contact wire support with FRP rod for 1,5 kV

<table>
<thead>
<tr>
<th>Type</th>
<th>H (mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>160</td>
<td>650 - 749</td>
</tr>
<tr>
<td>75</td>
<td>270</td>
<td>750 - 849</td>
</tr>
<tr>
<td>90</td>
<td>385</td>
<td>900 - 1099</td>
</tr>
</tbody>
</table>

Note:
Use and fastening according to local conditions.

Drawing number:
383.00036

Ordering information:
Length 750 mm
2411.75 Elastic contact wire support with FRP rod for 1,5 kV
Tunnel support, 15-25 kV

Note:
Hinged cantilever
Catenary system height variable
Use and fastening according to local conditions.
Drawing number:
371.00203

Note:
Hinged cantilever
Catenary system height variable
Use and fastening according to local conditions.
Drawing number:
371.00204

Note:
Fixed messenger wire
Suspension tube adjustable
System height variable
Use and fastening according to local conditions.
Drawing number:
371.00228

Note:
Hinged cantilever
Catenary system height variable
Use and fastening according to local conditions.
Drawing number:
371.00205
2425 Tunnel support FL260T, 15 kV

Note:
Hinged cantilever
Catenary system height variable
Use and fastening according to local conditions.

Drawing number:
371.00206
Note:
Hinged cantilever
System height variable
Use and fastening according to local conditions.

Drawing number:
371.00221
Spring support for single contact wire, 15 kV

Note:
Synthetic insulator spring support
Use and fastening according to local conditions.

Drawing number:
372.00076, .00284, .00567

Underbridge Arm for Drop Tube ø 101

Note:
Use and fastening according to local conditions.
**Drop tube for tunnel support, inclined plate**

2511

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>400</td>
</tr>
<tr>
<td>06</td>
<td>600</td>
</tr>
<tr>
<td>08</td>
<td>800</td>
</tr>
<tr>
<td>10</td>
<td>1000</td>
</tr>
</tbody>
</table>

**Associated parts:**
Hinged bracket 2521 o/w

**Drawing number:**
372.00048

**Ordering information:**
Length 800 mm, angle 45°

2511.08.45 Drop tube for tunnel support, inclined plate

**Drop tube for tunnel support, straight plate**

2512

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>300</td>
</tr>
<tr>
<td>07</td>
<td>700</td>
</tr>
<tr>
<td>08</td>
<td>800</td>
</tr>
<tr>
<td>10</td>
<td>1000</td>
</tr>
<tr>
<td>12</td>
<td>1200</td>
</tr>
<tr>
<td>14</td>
<td>1400</td>
</tr>
<tr>
<td>16</td>
<td>1600</td>
</tr>
<tr>
<td>18</td>
<td>1800</td>
</tr>
</tbody>
</table>

**Associated parts:**
Hinged bracket 2521 o/w

**Drawing number:**
372.00047

**Ordering information:**
Length 1200 mm

2512.12 Drop tube for tunnel support, straight plate
**2513**  Support bracket on tunnel wall

**Note:**
Length L  
- min. 150 mm  
- max. 500 mm

**Associated parts:**
Hinged bracket  2523

**Drawing number:**
371.00145

**Ordering information:**
Length 400 mm, angle 35°  
2513.400.35 Support bracket on tunnel wall

---

**2514**  Drop Tube ø 101 on Underbridge Arm

**Type**  | L (mm)  
---|---  
05 | 500  
06 | 600  
07 | 700  
08 | 800  
09 | 900  
10 | 1000  
11 | 1100  
12 | 1200  
13 | 1300  
14 | 1400  
15 | 1500

**Drawing number:**
372.00545

**Ordering information:**
Length 12 m  
2514.12 Drop Tube ø 101 on Underbridge Arm
Bracket for hinged tunnel support, straight

Fasteners:
Supplied complete with U-bolts.

Associated parts:
Insulator 5152 o/w

Drawing number:
371.00147

Ordering information:
2521 Bracket for hinged tunnel support, straight

Bracket for hinged tunnel support, inclined

Type \( \alpha \)
\((^\circ)\)
35 35°
45 45°

Fasteners:
Supplied complete with U-bolts.

Associated parts:
Insulator 5152 o/w

Drawing number:
371.00146, .00311

Ordering information:
Angle 35°
2522.35 Bracket for hinged tunnel support, inclined

Bracket for hinged tunnel support single track

Fasteners:
Supplied complete with bolts

Associated parts:
Insulator 5152 o/w

Drawing number:
371.00148

Ordering information:
2523 Hinged bracket for tunnel support single track
**Type L  L1  α**  
(mm)  (mm)  (°)  
11.35  1390  1190  35°  
11.45  1390  1190  45°  
16.35  1840  1640  35°  
16.45  1840  1640  45°  

**Drawing number:**  
371.00143  

**Ordering information:**  
Length 1840 mm, angle 35°  
2531.16.35 Cantilever tube for tunnel support, angled  

---  

**Type L**  
(mm)  
08  800  
10  1000  
12  1200  
14  1400  
16  1600  

**Drawing number:**  
371.00144  

**Ordering information:**  
Length 1200 mm  
2532.12 Cantilever tube for tunnel support, straight
**Conductor rail support, lateral**

Note:
Use and attachment in accordance with local conditions.
Available for 1,5 kV, 15 kV or 25 kV

Drawing number:
962.00832

**Conductor rail support, hinged**

Note:
Use and attachment in accordance with local conditions.
Available for 1,5 kV, 15 kV or 25 kV

Drawing number:
963.00168

**Conductor rail support, hinged, long**

Note:
Use and attachment in accordance with local conditions.
Available for 1,5 kV, 15 kV or 25 kV

Drawing number:
962.02136, .02324
2616  Conductor rail support, lateral

Note:
Use and attachment in accordance with local conditions.
Available for 1,5 kV, 15 kV or 25 kV

2617  Conductor rail support, lateral

Note:
Use and attachment in accordance with local conditions.
Available for 1,5 kV, 15 kV or 25 kV
Conductor rail support 3 kV, with sliding element 2626

Note:
Use and attachment in accordance with local conditions.

Drawing number:
963.00723

Conductor rail support 3 kV, with sliding suspension 2627

Note:
Use and attachment in accordance with local conditions.

Drawing number:
963.00898
Conductor rail support with sliding suspension, mounted in centre of the track

Note:
Use and fastening with drop tube according to local conditions.
Available for 1.5 kV, 15 kV or 25 kV.

Drawing number:
963.00534, .00534-1
Weight:
Wt (kg) = 23.4

Note:
Tightening torque M 16 = 190 Nm
On tube ø 88.9 mm

Drawing number:
962.01552

Note:
Use and attachment in accordance with local conditions.

Drawing number:
962.00920-4
Note:
Use and attachment in accordance with local conditions. Available for 1.5 kV, 15 kV or 25 kV.

Drawing number:
962.02304
Weight:
G (kg) = 1.11

Drawing number:
962.01121

Ordering information:
2644 Sprung conductor bar bracket
Conductor rail support, retractable, motorized 2711

Note:
Use and attachment in accordance with local conditions.
Available for 1.5 kV, 15 kV or 25 kV

Conductor rail support retractable, slave bracket 2712

Note:
Use and attachment in accordance with local conditions.
Available for 1.5 kV, 15 kV or 25 kV
**2713**  
Conductor rail support, retractable, motorized

*Note:*  
Use and attachment in accordance with local conditions.  
Available for 1,5 kV, 15 kV or 25 kV.

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**2714**  
Conductor rail support, retractable, slave bracket

*Note:*  
Use and attachment in accordance with local conditions.  
Available for 1,5 kV, 15 kV or 25 kV.
Associated parts:
Conductor rail support, retractable, slave bracket  2714

Drawing number:
963.01965

Ordering information:
2715 Engine and gear, direction of rotation left